THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES.

OCTOBER, 1891.

ON THE DISEASES OF THE KIDNEYS POPULARLY CALLED "BRIGHT'S DISEASE."

By Francis Delafield, M.D., LL.D.,
of New York.

Our notions concerning the nature of diseases and their treatment are greatly influenced by names and classifications. So, as our knowledge becomes more accurate, it is important, as fast as may be, to modify and change such names and classifications as have become a hindrance instead of a help.

The ordinary history of such names is that during the earlier periods of medicine some man more able than his fellows was able to group together a number of cases of diseases, to describe them plainly and to venture some theory as to their nature. Such a group of diseases then became known by the name of its describer, or by some arbitrary term. As time went on such a name acquired the dignity of use and custom, became generally accepted, and more and more traditions and classical descriptions accumulated about it, until in men's minds were established a name and a clinical picture to which, as to a Procrustean bed, they compelled their cases to correspond. With the further progress of medicine came the fresh study of the old diseases and the discovery that much could be seen and demonstrated which it was difficult to reconcile with the old traditions. Then came an unsatisfactory period during which the old name was retained as expressing a real entity, and the attempt was made to divide and classify the varieties of this entity. Lastly comes the time when the old name is retained as a popular term, but it is recognized that it does not really designate a distinct form of disease. Such has

been the history of such names as "cancer," "phthisis," and "Bright's disease."

I believe that the time has fully come to abandon the idea that there is such a disease as Bright's disease, and to cease from the attempt to describe varieties of a disease that does not exist. When we have divested our minds of this tradition we can begin to study the diseases of the kidneys and to try to classify them.

There seem to be three ways in which we can classify kidney diseases—according to their causes, according to the part of the kidney involved, or according to the nature of the morbid process.

The attempt to classify kidney diseases according to their causes is, in the present state of our knowledge, simply impossible.

The attempt to classify them according to the part of the kidney involved, to describe tubal nephritis, glomerulo-nephritis, interstitial nephritis, and arterio sclerosis, has been made many times. It has never given us a classification of any practical use for clinical purposes.

A classification according to the nature of the morbid process is altogether the most promising.

There are three morbid processes which occur in nearly every part of the body, which produce definite anatomical changes, cause regular clinical symptoms, and call for appropriate methods of treatment. These morbid processes are congestion, degeneration, and inflammation.

Congestion, whether acute or chronic, produces an accumulation of blood in the veins and capillaries of the part affected, causes local symptoms and disturbances of function, and is to be relieved by means addressed to the circulation of the blood.

Degeneration, whether acute or chronic, produces changes more or less profound in the parts affected; is regularly caused by poisons, by disturbances of circulation, and by other diseases; produces disturbances of function according to its severity; may be itself a cause of inflammation, and can be but little affected by any treatment.

Inflammation is attended with three essential features, which may occur separately or together—an escape of the elements of the blood from the vessels, a formation of new tissue, and a death of tissue. So we speak of exudative, productive, and necrotic inflammations.

Exudative inflammation is of short duration, leaves behind it no permanent changes in the parts affected, and can be favorably affected by treatment.

Productive inflammation runs an acute, subacute, or chronic course. It effects permanent changes in the inflamed parts. Its acute forms are very apt to become chronic. There is much variety as to the relative quantity of exudation and of new tissue. Treatment is not very satisfactory.

The different forms of kidney disease which are commonly included

under the name of Bright's disease can all be conveniently classified under the heads of—

Congestion of the kidney.
Degeneration of the kidney.
Inflammation of the kidney.

Such a classification has the merit of being simple and easily understood, of resting on an anatomical basis, and of being of practical use for clinical purposes.

I. The Congestions of the Kidney.

These are naturally divided into acute and chronic congestions. They must always depend upon causes which affect the circulation and cause an accumulation of venous blood in the kidney.

Acute congestion of the kidney is produced by the ingestion of poisons, by extirpation of one kidney, by injuries, by surgical operations, and by unknown causes.

It may occur in kidneys previously normal, or in those already diseased.

The most marked symptom is the diminution or suppression of the urine, but albumin and casts may be present.

Such an acute congestion is a transitory condition, but when it occurs with injuries and with surgical operations it may apparently be a cause of death.

Chronic congestion of the kidneys is produced by some long-continued mechanical interference with the circulation of the blood, an interference which necessarily causes congestion of other parts of the body as well as of the kidneys.

The characteristic changes in the kidneys are: Swelling or flattening of the epithelium of the cortex tubes, dilatation and thickening of the capillaries of the glomeruli, congestion and dilatation of the pyramid veins.

The urine is more or less diminished in quantity according to the intensity of the congestion.

The specific gravity is from 1.020 to 1.025, but it may for a time fall to 1.010 or rise to 1.035. The excretion of urea is usually ten grains to the ounce; it may rise to twenty-one grains. Albumin and casts are absent, or only present in very small quantities. The bad results of chronic congestion are the diminished production of urine and the liability to the supervention of chronic nephritis.

II. Degeneration of the Kidneys.

Degeneration of the kidney is always a secondary process produced by the introduction into the body of inorganic poisons or of the poisons of the infectious diseases, or by the effect produced on the body by

chronic diseases or vicious modes of life, or by disturbances of the circulation.

There are no changes in the kidneys except in the renal epithelium. In these cells are developed a variety of degenerative and necrotic changes.

It may happen that these degenerative changes are developed so rapidly that the bloodvessels are irritated, and there are added congestion and exudation of serum. We include, therefore, in this class both those kidneys the seat of degeneration alone, and those in which both degenerative and exudative inflammation exist, but the inflammation is secondary and subordinate to the degeneration.

Acute degeneration of the kidneys is found almost constantly with the infectious diseases and with poisoning by arsenic, phosphorus and mercury. It occurs in many different degrees of severity, and so we find the renal epithelium: merely swollen and granular, or infiltrated with granules, or broken and disintegrated, or in the condition of coagulation necrosis.

In correspondence with the degree of the degeneration of the renal epithelium is the severity of the clinical symptoms.

The urine is unchanged, or its quantity is diminished, or it contains a little albumin, or the albumin is abundant with casts and red and white blood-cells.

Many of the examples of this lesion are of so mild a type that they have no symptoms except the changes in the urine. The severe forms are dangerous to life; but dropsy and disturbances of the circulation are not associated with them.

Acute degeneration, therefore, includes a well-defined set of cases, definite in their lesions, their causes, their symptoms, and evidently not likely to be influenced by any treatment.

Chronic degeneration of the kidney is produced by the same mechanical causes as those which produce chronic congestion, by chronic alcoholism and by vicious modes of life. It is, therefore, always a secondary lesion.

The only changes in the kidney are in the epithelium of the tubes, of which the cells are swollen, granular, and infiltrated with fat. But if the degeneration is due to chronic congestion, there will also be changes in the glomeruli.

The quantity of the urine varies at different times in the same case and also in different cases; it may be abundant, scanty, or suppressed. Albumin and casts in moderate quantities are often present, but the specific gravity is not lowered.

Such a degeneration of the kidneys has a decided effect upon the health and nutrition of the patients. They lose flesh and strength, become anæmic, and finally pass into the typhoid state with delirium

and stupor. Dropsy and disturbances of the circulation are not associated with this form of kidney disease. As the kidney lesion is always secondary to some other serious morbid condition, it is often difficult to tell how much of the loss of health is due to the primary disease and how much to the change in the kidneys.

III. The Inflammations of the Kidney.

These are naturally subdivided into—

A. Acute exudative nephritis.
B. Acute productive or diffuse nephritis.
C. Chronic productive or diffuse nephritis with exudation.
D. Chronic productive or diffuse nephritis without exudation.
Suppurative nephritis.
Tubercular nephritis.

A. *Acute Exudative Nephritis.*—This is an acute inflammation of the kidney, characterized by congestion, an exudation of plasma, an emigration of white blood-cells, and a diapedesis of red blood-cells from the vessels; to which may be added swelling or necrosis of the renal epithelium and changes in the glomeruli.

Of such a nephritis we may distinguish three varieties:

1. A mild form, which gives symptoms during life, but leaves no lesions in the kidney after death.

2. A more severe form, in which we find inflammatory changes in the kidney after death.

3. A form characterized by the excessive production of pus-cells.

Lesions. In a nephritis of this type we should expect that the inflammatory products, the serum, white and red blood-cells, and coagulable matter from the blood-plasma, would collect in the Malpighian bodies and tubes or infiltrate the stroma between the tubes; and that of the inflammatory products in the tubes and Malpighian bodies a part would be discharged with the urine and a part found in the kidney after death. We should also expect that the quantity of inflammatory products would be in proportion to the severity of the inflammation, and that an excessive number of pus-cells would belong to the especially severe forms of the disease. Still further it is evident that, with the milder examples of nephritis, with but little exudation, no inflammatory products might be found in the kidney after death, all having been discharged into the urine during life.

As a matter of fact, the kidneys do present just such changes. In the mild cases we find no decided lesions in the kidney after death. In the more severe cases the kidneys are increased in size, their surfaces are smooth, the cortical portion is thick and white, or white mottled with red, or the entire kidney is intensely congested. If the stroma is

infiltrated with serum, the kidney is succulent and wet; if the number of pus-cells is very great, there will be little whitish foci in the cortex.

In such kidneys we find the evidences of exudative inflammation in the tubes, the stroma, and the glomeruli, all the changes being most marked in the cortical portion of the kidney.

The epithelium of the convoluted tubes is often simply flattened. As this same appearance is also found in the chronic congestion of heart disease, it seems probable that this change of the shape of the cells is merely due to the inflammatory congestion.

In other cases, not only is the epithelium flattened but there is also a real dilatation of the cortex-tubes. This dilatation does not involve groups of tubes, but all the cortex-tubes uniformly. In other cases, the epithelium of the convoluted tubes is swollen, opaque, degenerated, and detached from the tubes. But in fresh kidneys, properly preserved, this degeneration and desquamation of the epithelium is not nearly as constant or as marked a feature as would be supposed from the descriptions of some English observers. The tubes, whether with flattened epithelium or dilated, may be empty. More frequently, however, they contain coagulated matter in the form of irregular masses and of hyaline cylinders. The irregular masses are found principally in the convoluted tubes; they seem to be formed by a coagulation of substances contained in the exuded blood-plasma, and are not to be confounded with the hyaline globules so often found in normal convoluted tubes. The cylinders are more numerous in the straight tubes, but are also found in the convoluted tubes.

They also are evidently formed of matter coagulated from the exuded blood-plasma, and are identical with the casts found in the urine. The tubes may also contain red and white blood-cells.

In the cases in which there is an excessive emigration of white blood-cells, we find these cells in the tubes, in the stroma, or distending the capillary veins. This excessive emigration is not necessarily attended with exudation of the blood-serum, and so the urine of these patients may contain no albumin. The white blood-cells are not usually found equally diffused through the kidneys, but are collected in foci in the cortex. These foci may be very minute, or may attain a considerable size.

In the glomeruli we find changes which, at first sight, seem peculiar, but are really similar to the changes which we find in arteries and capillaries in many inflamed tissues. The cavities of the capsules may contain coagulated matter and white and red blood-cells, just as do the tubes. The capsular epithelium may be swollen, sometimes so much so as to resemble the tubular epithelium, and this change is most marked in the capsular epithelium near the entrance of the tubes.

The most noticeable change, however, is in the capillary tufts of the

glomeruli. These capillaries are normally covered on their outer surfaces by flat, nucleated cells, so that the tuft is not made up of naked capillaries, but each separate capillary throughout its entire length is covered over with these cells. There are also flat cells which line the inner surfaces of the capillaries, although not uniformly, as is the case in capillaries in other parts of the body. Still, in spite of the presence of all these cells, the outlines of the walls of the capillaries are fairly distinct.

In exudative nephritis the swelling and growth of cells on and in the capillaries change the appearance of the glomeruli. They are larger more opaque; the outlines of the main divisions of the tuft are visible, but those of the individual capillaries are lost. It is difficult to tell how much these changes in the glomeruli interfere with the passage of the blood through their capillaries. In most cases of exudative nephritis the patients recover and the glomeruli return to their natural condition

In some examples of exudative nephritis we also find a thickening of the walls of the branches of the renal artery within the kidney. This thickening is principally due to a swelling of the muscle-cells in the walls of these vessels.

Etiology. Acute exudative nephritis is frequently a primary disease, either occurring after exposure to cold, or without discoverable cause. It complicates scarlatina, measles, diphtheria, typhoid fever, acute general tuberculosis, pneumonia, acute peritonitis, dysentery, erysipelas, diabetes, and many other of the infectious diseases and severe inflammations. It is one of the forms of nephritis which complicate the puerperal condition.

Symptoms. In the milder cases the only symptoms are the changes in the urine. This is somewhat diminished in quantity, of normal or high specific gravity; it contains albumin in moderate quantities, a few casts, sometimes blood.

In the more severe cases the changes in the urine are more decided. It is diminished in quantity, or even suppressed; its specific gravity is normal or high; the quantity of albumin is very large; the casts are numerous, hyaline, granular, containing white or red blood-cells or epithelium; there are also free white and red blood-cells and epithelial cells from the kidney and the bladder. As a rule, the quantity of albumin and the number of casts are in proportion to the severity of the nephritis, but this is not always the case. Large quantities of albumin, numerous casts, and many white and red blood-cells may be found in the urine of kidneys which, after death, show no structural changes; while, on the other hand, small quantities of albumin and a few hyaline casts are compatible with a severe nephritis. Still further, the number of casts found in the urine during life is not always in proportion to the

number of casts and quantity of coagulated matter found in the corresponding kidneys after death.

In addition to the changes in the quantity and composition of the urine, the patients present constitutional symptoms which vary, in the different cases, as to their number and their severity. A febrile movement, with more or less prostration; stupor, headache, sleeplessness, restlessness, muscular twitchings, and general convulsions; dyspnœa, loss of appetite, nausea, and vomiting; a pulse of high tension with exaggerated heart-action, or hypertrophy of the left ventricle, dropsy and anæmia—these may be called the characteristic symptoms of acute exudative nephritis. Of these symptoms a certain number—the fever, the prostration, the loss of appetite and nausea, the anæmia, the diminution in the quantity of urine, the albumin and casts in the urine—are such as would naturally accompany an acute inflammation of the kidney, and very often they are the only symptoms which do accompany it.

But with this same kidney lesion a certain number of patients will present, besides the symptoms just mentioned, the additional features of cerebral symptoms, changes in the heart and circulation, and dropsy. We indeed might think that the cerebral symptoms and the dropsy were due to the diminished excretion of urine; but when these conditions occur, as they often do, in patients who are passing large quantities of urine of good specific gravity, and when they are absent, as they often are, in patients who are hardly passing any urine at all, it is evident that these symptoms are not directly due to the nephritis, but constitute a separate, complicating set of symptoms, which may be present or absent in any given case of the disease.

What the complicating lesion is which produces these symptoms we do not fully know; but the changes in the action of the heart and the dropsy naturally direct our attention to the arteries and capillaries, with the expectation of finding in them some morbid condition which will hinder the passage of the blood through them. Whether the morbid condition is of an inflammatory nature, or whether it is only a spasmodic contraction, we are as yet ignorant.

The cases of exudative nephritis, with an excessive production of pus-cells, have a somewhat different clinical history. Such a nephritis occurs both in children and adults; it may be primary, or complicate scarlatina, diphtheria, or measles.

The invasion is sudden, with a high temperature and marked prostration. Restlessness, delirium, headache, and stupor are soon developed and continue throughout the disease. The patients lose flesh and strength and pass into the typhoid state. Dropsy is slight or absent altogether. The urine is not so much diminished in quantity as one would expect; its specific gravity is not changed; albumin, casts, and red and white

blood-cells are present in considerable quantities, but not always early in the disease, and may even be absent altogether.

Prognosis. It is a very fatal form of nephritis, and yet one easily misunderstood on account of the resemblance of its symptoms to those of an acute meningitis.

B. *Acute Productive or Diffuse Nephritis.*—This is the most serious and important of all the forms of acute nephritis, not only for the reason that it involves so many of the structures of the kidney, but because its lesions are from the first of a permanent character, and because disturbances of the circulation are so frequently associated with it. It is one of the forms of scarlatinal nephritis; it occurs early and late in the course of diphtheria; it is the most important variety of the nephritis of pregnancy, and it is especially frequent as a primary nephritis with or without a history of exposure to cold.

Lesions. The changes in the kidneys are extensive and well marked. The kidneys are large, at first smooth, later sometimes a little roughened; the cortical portion is thick, white, or mottled with yellow or red, or congested; the pyramids are red.

In these kidneys we find the same lesions as have been described as belonging to exudative nephritis, but with two additional changes—changes which are found in the earliest stages of the inflammation and which give the characteristic stamp to the lesion; first, a growth of connective tissue in the stroma; second, a growth of the capsule-cells of the Malpighian bodies. Both these changes do not involve the whole kidney, but symmetrical strips or wedges in the cortex, which follow the line of the arteries. These wedges are small or large, few or numerous, regular or irregular, in the different kidneys. But in every wedge we find the same general characters: one or more arteries of which the walls are thickened; the Malpighian bodies belonging to this artery show an enormous growth of capsule-cells, with compression of the tufts; running parallel to these arteries a growth of connective-tissue cells and basement substance in the stroma. Between the wedges we find at first only the changes of exudative nephritis; later, a growth of diffuse connective tissue. Sometimes we find these wedges small, symmetrical, and at considerable distances from each other; more frequently they are much closer together, sometimes even becoming continuous.

If the nephritis is of acute type and recent, the new tissue between the tubes consists largely of cells; if the nephritis is of subacute type and longer duration, the tissue is denser and has more basement substance. Where the growth of new tissue is abundant, the tubes become small and atrophied.

In the wedges the constant change is the growth of new tissue in the stroma between the tubes, not an infiltration of the stroma with pus-cells, as in an exudative nephritis, but a new growth of cells and of

basement substance. The tubes seem to become compressed and atrophied between the new tissue.

In each wedge is one or more of the arteries which run up into the cortex and give off the little branches ending in glomeruli. The walls of these arteries are thickened.

The glomeruli belonging to these arteries become the seat of changes of a permanent character. There is the same growth of the cells covering the vessels, and of the cells within them, as in exudative nephritis, reaching even a greater development. In addition, there is a growth of the cells lining the capsules to such a degree as to form a mass of cells compressing the tuft. The tuft apparently never returns again to its natural condition, but, as time goes on, the vessels are obliterated, the capsule-cells are changed into connective tissue, and the glomeruli are finally transformed into little balls of fibrous tissue.

Symptoms. The urine during the acute periods of the nephritis is scanty, colored by blood, of high specific gravity. It contains much albumin, numerous casts of all kinds, and red and white blood-cells. Exceptionally, the casts are few or absent. Later in the disease, or when it is of a more subacute type, the urine is more abundant, the specific gravity falls, the albumin and the casts continue. In the protracted cases the albumin and casts may for a time diminish or even disappear.

The patients develop all the symptoms which we are accustomed to associate with Bright's disease—headache, restlessness, neuralgic pains, delirium, stupor, coma, muscular twitchings and general convulsions, dyspnœa and cough, loss of appetite, nausea and vomiting, neuro-retinitis, diarrhœa, increased arterial tension and hypertrophy of the left ventricle of the heart, anæmia, loss of flesh and strength, and dropsy, often developed to an extreme degree.

The course of the disease varies with the intensity with which it is developed and the rapidity with which it proceeds.

The invasion may be sudden, the symptoms marked, and the duration of the disease short, with a fatal termination; or, with the same acute invasion, the disease may be protracted over many months; or the invasion may be gradual, the course of the disease subacute, the symptoms not continuous, but with periods of improvement or even apparent recovery, and the duration of the disease protracted for months and years.

The *prognosis* of this form of nephritis is bad. The lesion is a permanent and progressive one. It is, indeed, apparently possible to recover from it, although with damaged kidneys, but this is the exception. The rule is that, sooner or later, the disease proves fatal, although it may well happen that periods of improvement give rise to false hopes of recovery.

c. *Chronic Productive, or Diffuse Nephritis with Exudation.*—Although it is convenient to describe two forms of chronic nephritis—one with exudation and one without—yet it must be remembered that these are not separate lesions of the kidneys, but varieties of the same lesion. For, in all these kidneys, one form of inflammation—productive, with the formation of new tissue—is present. The exudation from the vessels is something which is added to this, but does not change it.

In speaking of the exudation of serum from the vessels and its presence in the urine, we speak of it as it occurs during the whole course of the disease, and not as it occurs for short periods.

We mean that in an exudative chronic nephritis there is usually a large quantity of albumin in the urine, but that in the protracted cases there may be periods during which the albumin diminishes or entirely disappears. In the same way in a non-exudative nephritis there may be periods during which albumin is present in considerable quantities. Generally speaking, the character of the clinical symptoms will vary with the presence or absence of the albumin.

Lesions. In chronic nephritis with exudation the size of the kidney is usually increased; there is a very extensive growth of connective tissue in the cortex; the renal epithelium is swollen, granular, degenerated, fatty, broken, or flattened; the tubes contain coagulated matter, cast matter or blood; the cortex tubes are atrophied in some places, dilated in others.

The glomeruli are changed in several different ways:

1. There is a growth of the capsule-cells in such numbers that they compress the tufts. The cells covering the capillaries are also increased in size and number. The capsule-cells may finally be changed into connective tissue and the tufts become atrophied.

2. The glomeruli are of large size, the cells covering the capillaries are increased in number so that the outlines of the capillaries are lost, but yet the capillaries are not compressed nor the glomeruli atrophied.

3. There is a growth of the cells which cover the capillaries and of the cells within them. Of the cells which cover the capillaries the cell-bodies become very large, the capillaries are compressed, and the glomeruli eventually become atrophied.

4. The walls of the capillary vessels become the seat of waxy degeneration, while the cells which cover them are increased in size and number.

5. If the nephritis follows chronic congestion, the capillaries are dilated and there is an increase in the size and number of the cells which cover the capillaries.

The arteries remain unchanged, or they are the seat of obliterating endarteritis, or there is a symmetrical thickening of all the coats of the artery, or all the coats of the artery are thickened and converted into a

uniform mass of dense connective tissue, or there is waxy degeneration of the walls of the artery.

Causes. This form of nephritis occurs very frequently as a primary disease, especially in young adults. It follows acute diffuse nephritis, chronic congestion and chronic degeneration of the kidney. It may complicate syphilis, chronic phthisis, chronic endocarditis, prolonged suppuration, and chronic inflammation of the bones and joints.

Symptoms. The urine varies in quantity at different times. When the nephritis is most quiescent the quantity of urine is normal. During the exacerbations of the nephritis the urine is scanty or suppressed. When the patients are doing badly, often when they are dropsical, the quantity of urine is very much increased.

The specific gravity and the proportion of urea to the ounce of urine slowly diminish. In the cases of shorter duration the specific gravity is apt to run between 1.012 and 1.020. In the very chronic cases it will be between 1.001 and 1.005. Very low specific gravities regularly indicate a large growth of connective tissue in the stroma of the cortex, or waxy degeneration of the capillaries of the glomeruli.

The urine regularly contains albumin and casts. During the active periods of the disease the quantity of albumin is very large; during its quiescent periods it is smaller, and at times may entirely disappear. The number of casts varies in proportion to the quantity of albumin, but occasional exceptions to this rule are seen.

Dropsy may be considered a regular symptom of chronic exudative nephritis. It is rare to find a patient who goes through the disease without exhibiting this symptom. It may be developed at any time in the disease, continue uninterruptedly, or occur only in attacks. A peculiar pallor of the skin and white color of the sclerotic is seldom absent, and is quite characteristic of the disease. It corresponds to a diminution in the quantity of hæmoglobin and in the number of the red blood-cells. These changes in the blood are not, as a rule, far advanced; but sometimes they are, and some cases even die with the symptoms of pernicious anæmia.

Many of the patients are troubled with headache and sleeplessness. Acute uræmic attacks, with contraction of the arteries, convulsions, etc., may occur in the course of a chronic exudative nephritis, but they are of very much more frequent occurrence with the non-exudative form of the disease.

Chronic uræmia, on the contrary, is one of the ordinary ways in which an exudative nephritis proves fatal. The patients pass into a condition of alternating delirium and stupor, with a rapid, feeble, soft pulse.

Simple neuro-retinitis or nephritic retinitis are developed in a moderate number of cases.

Dyspnœa is a nearly constant symptom, but it is not always the same kind of dyspnœa, nor always produced by the same cause. It may be due to hydrothorax, to œdema of the lungs, to contraction of the arteries, or to failure of the heart's action.

In many patients the dyspnœa due to contraction of the arteries, or to failure of the heart's action, is the first symptom which attracts attention. It is a dyspnœa which comes on in attacks, especially at night and in the early morning, and is regularly worse when the patient lies down. It often begins while the patient is apparently in good health, but it is a sure premonition of serious disease.

A catarrhal bronchitis with cough and expectoration is often present.

Loss of appetite, nausea, and vomiting are frequent symptoms.

The heart is often affected. There may be hypertrophy of the left ventricle, dilatation of both ventricles, chronic endocarditis, myocarditis, or a feeble heart.

Course of the disease. There is hardly any limit to the variety of the disease, but the most constant symptoms are anæmia, dropsy, and albumin in the urine.

1. There are cases in which the symptoms are nearly continuous, the patients get steadily worse and die within one or two years. The anæmia, the dropsy, and the albumin are constantly present, and the patients die with dropsy or with chronic uræmia.

2. There are cases in which the anæmia, the dropsy, and the dyspnœa come on in attacks which last for weeks or months. Between the attacks the patients are comparatively well, often able to work, although the urine always contains albumin.

3. There are cases in which a number of years before death the patient has an attack of dropsy, etc., from which he apparently recovers and goes on able to work, but with urine of low specific gravity, which sometimes contains albumin. After an interval of many years comes the fatal attack with all the characteristic symptoms.

4. There are cases which for years have no symptoms but pallor of the skin and urine of low specific gravity containing albumin. These patients often for a long time feel so well that they cannot understand that they have a serious disease.

5. There are cases in which the first symptom is the attack of spasmodic dyspnœa, the patients otherwise feeling well. It may be months or years before the other symptoms are developed.

6. There may be a history of chronic endocarditis lasting for years before the renal symptoms are developed.

7. There are cases which apparently recover from the disease.

The *prognosis* is bad, but life may be prolonged for many years with but few symptoms, and recovery seems to be possible.

D. *Chronic Diffuse Nephritis without Exudation.—Lesions.* The larger number of these kidneys are found after death to be diminished in size; the two kidneys together may not weigh more than two ounces. The capsules are adherent, their surfaces are roughened or nodular, the cortex is thin and of red or gray color. A considerable number of the kidneys do not differ in their size or appearance from normal kidneys, except that the capsules are adherent and the surfaces of the kidneys roughened.

Many examples of chronic non-exudative nephritis follow chronic congestion. The kidneys then remain hard, but the cortex becomes thinned, the capsules adherent, and the surface roughened. Some of the kidneys, instead of becoming atrophied, are increased in size, weighing together from sixteen to thirty-two ounces. The surfaces of these large kidneys may be smooth or nodular; the cortex is thickened, its color is red, gray, or white. There is regularly a growth of new connective tissue in the cortex and also in the pyramids, which becomes more and more marked as the disease goes on. In the cortex the new tissue follows the distribution of the normal subcapsular areas of connective tissue, is in the form of irregular masses, or is distributed diffusely between the tubes. In the pyramids the growth of new connective tissue is diffuse.

The tubes, both in the cortex and pyramids, undergo marked changes. Those included in the masses of connective tissue are diminished in size; their epithelium is flattened, some contain cast matter, many are obliterated. The tubes between the masses of new connective tissue are more or less dilated; their epithelium is flattened, cuboidal, swollen, degenerated, or fatty. The dilatation of the tubes may reach such a point as to form cysts of some size, which contain fluid, or coagulated matter. These cysts follow the lines of groups of tubes, or are situated near the capsules.

Of the glomeruli a certain number remain of normal size, but with the tuft-cells swollen, or multiplied. Many others are found in all stages of atrophy until they are convered into little fibrous balls. The atrophy seems to depend partly on the growth of tuft-cells and intracapillary cells, partly on the thickening of the capsules, partly on the occlusion of the arteries. If the chronic nephritis follows chronic congestion the glomeruli remain large, but with a marked growth of tuft-cells; or they become atrophied, but with the dilatation of the capillaries still evident. The capillaries of the glomeruli may be the seat of waxy degeneration.

The arteries exhibit the same changes as are found in chronic exudative nephritis.

Complicating lesions. Hypertrophy of the left ventricle of the heart is frequently caused by exudative nephritis, but still more frequently by the non-exudative form; but it must be admitted that such an hyper-

trophy, although frequent, is not constant, that both with exudative and non-exudative nephritis there may be no change in the wall of the left ventricle. The hypertrophy of the wall of the ventricle may after a time be succeeded by dilatation, or chronic degeneration, or myocarditis.

Chronic endocarditis is very frequently associated with chronic Bright's disease. The valvular lesions may cause chronic congestion, chronic degeneration, or chronic nephritis; or the same patient may suffer from chronic endocarditis, and either form of chronic nephritis, the lesions associated possibly due to the same causes, but not dependent on each other.

Pulmonary emphysema, chronic endocarditis, and cirrhosis of the liver, all of them examples of chronic productive inflammation, frequently accompany chronic nephritis.

With the endarteritis comes the additional danger of cerebral hæmorrhage.

Patients suffering with chronic nephritis are more liable than are other persons to attacks of pericarditis, bronchitis, and gastric catarrh.

Symptoms. The typical urine of chronic non-exudative nephritis is a urine increased in quantity, of a specific gravity of about 1.010, containing a diminished quantity of urea, without albumin or casts, or with a trace of albumin and a very few casts, except during exacerbations of the nephritis, when the quantity of albumin and the number of casts may be considerable. But very important modifications of the urine are of ordinary occurrence. It is quite possible, with nephritis of this type far advanced, to have urine not below 1.020 in specific gravity, and without albumin or casts. In such cases the diagnosis has to be made without reference to the urine. On the other hand, there are cases in which the specific gravity of the urine falls very low, almost to 1.000, either with or without waxy degeneration of the vessels. There are cases in which the quantity of urine is very much increased, several quarts in the twenty-four hours. During the attacks of contraction of the arteries, to which these patients are liable, the urine may be diminished to a few ounces or suppressed.

In a great many of the cases cerebral symptoms are developed at some time in the course of the disease. Headache and sleeplessness are often present, the headache sometimes so severe and continuous that the patient is nearly maniacal; or instead of the headache there are neuralgic pains in the different parts of the body.

Muscular twitchings and general convulsions are much more serious; they may be an early symptom, or not occur until late in the disease.

Hemiplegia, with or without aphasia, may be the first symptom to call attention to the nephritis, or may not occur until late in the disease. The invasion of the hemiplegia is sudden and is usually accompanied by coma. There is loss of motion alone, or of both motion and sensation.

The hemiplegia, coma, and aphasia may continue up to the time of the patient's death, or disappear after a few hours or days. In the latter case the patient may have several such attacks. These attacks have been ascribed to localized œdema of the brain. In the cases which I have seen there were no changes in the brain-tissue, but the cerebral arteries were damaged by chronic endarteritis.

Delirium, mild or violent, stupor, and coma may come on in sudden attacks, or be developed slowly and gradually.

When these cerebral symptoms come on in attacks, the arteries are contracted, the temperature is raised, and the patients are said to suffer from acute uræmia. Very often they recover from a number of these attacks. In the fatal attacks the pulse often loses its tension, but becomes rapid and feeble, and the patients die comatose, with a feeble heart.

Instead of such acute attacks of cerebral symptoms, the symptoms may come gradually in persons already much reduced by the kidney disease. The temperature is then apt to be below the normal, and the pulse is rapid and feeble.

Temporary blindness, neuro-retinitis, or nephritic retinitis, are developed in a moderate number of these patients.

Chronic bronchitis and emphysema very frequently exist, and their symptoms often form a large part of the clinical history.

The left ventricle of the heart is regularly hypertrophied. This by itself gives no symptoms; but if the arteries become contracted, or if the hypertrophied heart becomes feeble, then disturbances of the circulation are established which cause serious symptoms.

In the same way the complicating endocarditis which so often exists gives no trouble until the valves are a good deal changed, or the ventricles dilated, or the heart's action altered, or the arteries contracted; then the circulation is interfered with, and the results of venous congestion of different parts of the body show themselves.

Dyspnœa is a very frequent symptom, often the first symptom noticed by the patient. It is a spasmodic dyspnœa coming on in attacks which last for minutes, hours, or days. It is regularly made worse by mental or bodily exertion, or by the recumbent position. It does not resemble pulmonary asthma. It is apparently due to the association of changes in the arteries and in the heart. With contraction of the arteries alone, or with a feeble heart alone, no dyspnœa may exist; but if the contraction of the arteries is so great that the hypertrophied and laboring heart is unable to overcome the obstruction, or if with the contracted arteries the heart becomes dilated or feeble, then the attacks of dyspnœa begin. At first the attacks are not severe and are of short duration, but if the mechanical conditions which cause them cannot be controlled, they become longer and more distressing.

Perhaps the most striking examples of this dyspnœa are in the patients in whom it is the first symptom of the nephritis. They are apt to be middle-aged or elderly men, often engaged in large financial or commercial enterprises. They profess that they feel quite well and that they can attend to their affairs perfectly, but that they are very much annoyed because early every morning they have an attack of asthma. In spite of their professions of good health, it is evident that they are pale and that they have dyspnœa on exertion. The heart is found to be enlarged, with or without a murmur; its action is either labored or feeble. The pulse is tense. The urine is of a specific gravity of 1.010 to 1.030; it contains no albumin, or only a trace. In the earlier stages of the disease this dyspnœa can be controlled, but later on it is more distressing and difficult to remedy.

The stomach may become the seat of catarrhal gastritis or of spasmodic vomiting. But in some patients it continues to perform its functions fairly well.

Dropsy, as a rule, is absent with non-exudative nephritis, unless it is complicated by chronic endocarditis or cirrhosis of the liver.

Profuse bleeding from atrophied kidneys has been described by Bowlby in three cases.

Regularly, after a time, the nephritis exerts its effect upon the nutrition of the patient, and the flesh and strength are diminished. On the other hand, the patients do not become as pale as they do in exudative nephritis.

Course of the disease. It is characteristic of the chronic productive inflammations of the lungs, the heart, the arteries, the liver, and the kidneys, that, while they often exist as serious and fatal diseases, they also frequently exist as lesions which do not interfere with general good health and long life. This seems to depend, in part at least, on the rapidity with which the inflammatory changes in these different parts of the body are developed. If they are developed slowly enough the functions of the organ continue to be performed, in spite of the new growth of connective tissue in it.

So, with the kidneys, it is common enough to find chronic non-exudative nephritis far advanced in persons who die from accident or intercurrent disease, and have never given symptoms of renal disease.

In the same way we can often observe for years persons who have urine of low specific gravity, an hypertrophied left ventricle of the heart, and occasionally some increase of tension in the arteries, and who yet habitually enjoy very fair health.

But yet these same persons, if they are attacked with pneumonia or pericarditis, or suffer from a severe accident, will often develop serious or even fatal renal symptoms.

A very common form for the disease to take is that of attacks which

are repeated a number of times, each attack worse than the preceding, and the general health more and more impaired between the attacks. During the attacks there are cerebral symptoms more or less severe—headache, sleeplessness, delirium, stupor, coma, convulsions. Dyspnœa may be present or absent. The arteries are contracted, with a tense pulse. There is loss of appetite, nausea, and vomiting. The urine is of low specific gravity and usually contains albumin. Between the attacks the patients at first seem to be fairly well, but later they gradually lose flesh and strength. The urine between the attacks is of low specific gravity and contains little or no albumin. They finally die in one of the attacks, feeble and emaciated.

In some of the patients spasmodic dyspnœa is the first symptom. This can often be controlled for months and years, and the patients then seem to be well. But after a time it is more difficult to manage, and other renal symptoms are added.

In some cases there are no symptoms for a long time, so that persons apparently in good health are attacked without warning by convulsions, coma, delirium, or hemiplegia. They may die in the first attacks or live to go through subsequent ones.

In some cases the only symptoms up to the time of the patient's death are gradual loss of flesh and strength and disturbance of digestion, the patient dying feeble and emaciated. These cases are hard to make out, unless the specific gravity of the urine is low and a little albumin present. Otherwise there is nothing to draw attention to the kidneys as the cause of the illness. Loss of eyesight from nephritic neuro-retinitis may be the first symptom.

The patients may suffer from the symptoms of cardiac disease for years before congestion or degeneration of the kidney is succeeded by chronic nephritis.

In many cases the course of the nephritis is modified by the complicating emphysema, phthisis, endocarditis, endarteritis, or cirrhosis of the liver.

Treatment.

Such a classification as that above given of kidney diseases brings with it a rational system of therapeutics.

Acute congestion of the kidneys can be relieved by the application of heat to the surface of the body.

Chronic congestion is best managed by the drugs which stimulate the heart and dilate the arteries.

We evidently have no means at our command by which we can influence acute degeneration of the renal epithelium; fortunately the great majority of the cases of acute degeneration are not serious.

Chronic degeneration also seems to be a condition which we are unable to treat.

In acute exudative and in acute diffuse nephritis the main indications for treatment are to diminish the severity of the nephritis and to regulate the circulation. To diminish the severity of the nephritis we employ cups over the lumbar region, heat over the lumbar region or over the entire body, and the internal use of calomel, sulphate of magnesia, opium, aconite, or digitalis.

The disturbances of the circulation are largely the causes of the cerebral symptoms and of the dropsy. With a laboring heart and contracted arteries we employ the drugs which dilate the arteries—chloral hydrate, opium, nitrate of amyl, and nitro-glycerin—or we diminish the quantity of the blood by venesection, sweating, or purging. With a feeble heart and relaxed arteries we use the cardiac stimulants.

In chronic nephritis climate and mode of life constitute the important parts of the treatment; it is doubtful if drugs exert any effect on the nephritis. A warm, dry climate and an out-of-door life are of the greatest importance. Medical treatment can, however, be employed with advantage for the relief of the anæmia, the dropsy, and the disturbances of circulation.

With the classifications of kidney disease now in common use you are all familiar. You know the number of names employed and the contradictory meanings attached to these names by different authors. Many of you must have experienced the extreme difficulty there has been in teaching students to understand Bright's disease. I leave it to you to determine how far the plan which I have proposed is likely to be of practical use.

CLINICAL OBSERVATIONS ON THE CARDIAC BRUITS OF CHLOROSIS.

By Alfred G. Barrs, M.D., M.R.C.P.,
SENIOR ASSISTANT PHYSICIAN TO THE GENERAL INFIRMARY AT LEEDS; LECTURER ON MATERIA MEDICA AND THERAPEUTICS IN THE YORKSHIRE COLLEGE OF THE VICTORIA UNIVERSITY.

In the medical out-patient department of the Leeds Infirmary, during the last two and a half years, I have been able to record the presence or absence of cardiac bruits in 205 cases of simple chlorosis. Cardiac bruits were present in 115 cases, and absent in 90 cases.

In the 115 cases in which bruits were present, their locality was recorded as follows:

A systolic bruit, audible at the base only,				in	56 cases
"	"	"	apex "	"	13 "
"	"	"	base and apex	"	24 "
"	"	"	base, apex, and back,	"	22 "
					115 "

So that in 102 cases a bruit, always systolic in time, was heard at the base, wherever else it might be heard, showing the great preponderance of basic bruits over apical bruits pure and simple—a fact in accord with general experience.

The cases in which the systolic bruit was audible at the base, at the apex, and in the back are naturally those which will excite the most interest, and it is to them particularly that I intend the few remarks which follow to apply; at the same time, it will be perceived that whatever can be said of the chlorotic bruit following, in its locality, rhythm and conduction, all the characters of the mitral regurgitant bruit of organic disease must be applicable *pari passu* to all cardiac bruits arising in the chlorotic state.

I may at once assure the reader that I have no intention of launching into any theoretical disquisition upon the causation of the anæmic murmur beyond the little that is necessary to elucidate the important clinical facts, as they seem to me, which these figures put before us.

It is now about three years ago that I became aware of the fact that in a certain proportion of cases of chlorosis a systolic murmur may be heard, not only at the base and apex, but also at the angle of the left scapula and in its immediate neighborhood, and since then I have been careful to note the locality of all bruits heard in cases of that disease, with the result shown in the figures given above.

The bruits were in all cases clear and distinct, though usually of a soft, blowing character, and audible to the students frequenting the out-patient room, so that there could be no reasonable doubt attaching to the observations. But I am quite sure that now and again the anæmic murmur may be observed to come and go, so that at one time it may be audible and at another not so. Hope noticed this fact, for in his work on *Diseases of the Heart*[1] he says, speaking of the inorganic murmur: "The murmur is not constant, but occasional, coming on whenever the circulation is excited, and for exciting it the most trivial causes, as Laennec has observed, are sufficient."

In the crush and hurry of the out-patient rooms it has been impossible, I am sorry to say, for me to record accurately the concomitant conditions of the heart, but there is no doubt that in the cases presenting a bruit audible at the base, the apex, and in the back, marked changes in the character of the impulse and in the locality of the apex-beat were almost always present, indicating dilatation of the ventricle or ventricles and an increased force of the cardiac contraction. So well marked and constant have these changes been, that I have found myself able, with tolerable certainty, to predict the bruits to be heard after placing the hand upon the præcordium. These changes in the cardiac

[1] 1839 ed., p. 106.

chambers, the result of anæmia, were first seriously studied in this country by the late Dr. Pearson Irvine, who made an elaborate communication to the Royal Medical and Chirurgical Society on May 22, 1877,[1] on the subject, in which he stated that "The apex-beat in chlorotics is carried too far outward, is too diffuse, and in this respect corresponds with the general cardiac impulse, which is usually 'slapping' and like that met with in organic disease." This statement is quite in accord with my own observations, the conditions described by Dr. Irvine being most marked in the 22 cases in which the bruit was audible in the back as well as at the apex and base.

Speaking from my own cases, the duration of the cardiac murmur of chlorosis is not long after the patient has been put under efficient treatment by iron. I should say that, *as a rule*, all murmurs have disappeared at the end of three weeks on the average. In the base, apex, and back cases, the order of their disappearance was the reverse of that named, the basic murmur being the last to depart. This seems to suggest what I have no doubt is the fact—that whatever the mechanical conditions giving rise to the bruits may be, the basic bruit is the earliest and mildest result of them, the back bruit the latest and most serious.

In regard to the general conditions attendant upon bruits in chlorosis, I have found it impossible to predict with certainty any cardiac change that may be present from the intensity of the pallor, the duration of the amenorrhœa, or the obstinacy of the constipation—those cases in which the blood-change seemed greatest having sometimes no bruit at all, while those which had a minimum degree of pallor might present bruits audible at the base, apex, and back.

An apex murmur, systolic in time and conducted to the angle of the left scapula, has usually been held to be distinctive of mitral regurgitation; and further, by those who do not agree that mitral regurgitation may take place from functional or recoverable conditions of the mitral orifice and its valve, is also held to be distinctive of organic disease. I well remember that Dr. Fagge always taught that a systolic bruit audible at the apex only might be either organic or inorganic in its origin; but if the murmur was also audible at the angle of the scapula, then there could be no reasonable doubt as to the organic nature of the condition giving rise to the abnormal sound. In his article on "Diseases of the Valves of the Heart,"[2] Dr. Fagge, after quoting Dr. Bristowe, Dr. Austin Flint, and Dr. Andrew, says: "These authorities believe that there are two criteria which may be applied to the determination of the fact that in a particular case a systolic apex murmur is really due to mitral regurgitation. The criteria are: 1. That the murmur

[1] Lancet, June 9, 1877, p. 837.

[2] Reynolds' System of Medicine, vol. iv. p. 643.

should be audible in the left side of the back about the inferior angle of the scapula. 2. That the pulmonary second sound should be intensified." He then says, a little later on in the same article: "My own views with regard to the interpretation of systolic apex murmur may be summed up as follows: 1. If such a murmur be audible in the back, it indicates mitral regurgitation. 2. If such a murmur be heard only at the heart's apex, we are unable at the present time to pronounce any positive opinion as to its cause, etc." I think there can be no doubt, from the title and context of Dr. Fagge's article, that he uses the term "mitral regurgitation" as synonymous with "mitral disease."

Walshe,[1] speaking of hæmic murmurs, says: "They are only in exceptional cases audible below the nipple and never within my experience perceptible as far as the left apex or outward toward the axilla." He says also in a note:[2] "I have never yet heard in a purely chlorotic woman a murmur having all the characters of a mitral regurgitant one."

I need not produce further evidence to show how strongly it is held that apical murmurs audible in the back always mean organic disease of the mitral valve. On the other hand, I am able to point to twenty-two cases, in twenty of which murmurs identical with those heard in undoubted examples of mitral disease disappeared under treatment in the course of two or three weeks. Nor am I alone in this observation. Dr. Kingston Fowler[3] says, after reference to the works of Dr. Walshe and Dr. Hoyden: "Is every patient presenting the signs of mitral regurgitation, a systolic apex murmur conducted to the angle of the scapula and audible in the vertebral groove between the sixth and ninth dorsal vertebræ, to be considered the subject of organic disease of the mitral valve? According to Dr. Hoyden and Dr. Walshe this question must be answered in the affirmative. My own experience points to an exactly opposite conclusion. I have within the last three months seen at least fifteen cases of advanced chlorotic anæmia among my out-patients at the Middlesex and Brompton Hospitals, of whose cases I have careful notes, and in whom I have detected a systolic apex murmur, which has been distinctly audible not at the angle of the left scapula only, but in many at the right also, and in most of which cases the bruits have already disappeared under appropriate treatment. I have long taught that the anæmic murmurs obey the same law as to conductions as those of organic origin, and particularly that the conduction of the systolic apex murmur to the angle of the scapula is no sign of disease of the mitral orifice."

[1] Diseases of the Heart, 4th ed., 1873. Page 86.

[2] Op. cit., page 89.

[3] On the Origin of Anæmic Murmurs. London, 1884. Page 35.

Dr. Broadbent also says:[1] "The occurrence of dilatation of the left ventricle and mitral regurgitation is very common as an effect of anæmia."

I do not attempt to reconcile these conflicting statements and experiences. I am content to accept the fact that an apex murmur audible at the angle of the scapula is not unfrequently to be observed in chlorosis, and also that the bruit disappears under treatment directed to the removal of the blood state, and so cannot well be due to structural changes in the mitral valve.

In two of the twenty-two cases the mitral regurgitant murmur has not yet disappeared, and as the cases have now been under observation for seven and nine months respectively, there is great probability that permanent changes in the heart have taken place. I will very briefly relate the chief points in these two cases.

CASE I.—Rhoda H., aged twenty-two years, came under observation January 7, 1891. She presented all the characteristic symptoms of marked chlorosis, except that she was menstruating regularly, and had not constipation. She had not had any rheumatic manifestation nor chorea. The cardiac action was extremely irregular, but no bruit could be heard on this occasion. She was ordered a perchloride of iron mixture. On February 2d she was improving in appearance and general symptoms. The heart's action was still irregular, and a systolic bruit was heard at the apex only. February 17th: Heart's action quite regular, systolic bruit heard at the apex and at angle of the left scapula. She has taken the iron mixture since January 7th. On March 3d I made a note that I thought the bruit was organic, and ordered her a digitalis mixture and sulphate of iron pills. May 26th: Has taken digitalis and iron regularly since March 3d (eleven weeks); cardiac action very irregular, systolic apex bruit heard occasionally. On July 10th she was reported very ill and unable to attend. Saw her ten days ago. Heart regular. Bruit still present.

I have very little doubt that this case ought to be regarded as one of chlorosis in which the bruit has become permanent, unless, as is quite possible, she is the subject of long-standing mitral disease, and had by accident, as it were, become chlorotic. Stokes[1] narrates a precisely similar case, in which mitral disease was found on post-mortem examination, and says that the combination of organic and anæmic murmurs, especially in young females, is not unfrequent, and it is often difficult to say whether the organic or functional disease has had the initiative. "Under these circumstances we have generally with the symptoms of anæmia the physical sign of a mitral murmur unattended by evidence of hypertrophy of the heart."

CASE II.—Ruth A. R., aged fifteen years, came to the out-patient room on November 18, 1890, with a chlorotic aspect and the usual symp-

[1] The Pulse. London, 1890. Page 160.

[2] Diseases of the Heart and Aorta. Dublin, 1854. Pages 150, 151.

toms. She had not menstruated. There was no constipation. She had not had any rheumatic manifestation nor chorea. A systolic bruit was heard at the base, apex, and back. She was ordered perchloride of iron in mixture. December 9th: Bruit still audible in all areas. January 13, 1891: Bruit persists in all areas. I made a note on this date that the bruit sounded like an organic bruit. February 24th: Bruit very faint to-day; so much so that I thought it had disappeared, after all. May 26th: Bruit very loud to-day in all areas and rough in character. She has been taking iron continuously since November 18, 1890, and has improved in appearance and has practically no symptoms. (P. S.) July 17th: Bruit still audible in all areas.

Here, then, are two cases in which a bruit indistinguishable from that of mitral regurgitation due to organic valvular disease persists in spite of long-continued treatment directed to the removal of the anæmic state. The observation of them has called to my mind an important and exceedingly interesting paper by Dr. Goodhart[1] on "Anæmia as a Cause of Heart Disease," in which he says that anæmia, by leading to dilatation of the left ventricle is a fertile source of valvular disease, and chiefly of mitral disease. Dr. Goodhart's cases were, I should observe, not cases of chlorosis, but of secondary anæmia; he nevertheless very properly applies his conclusions to chlorosis and all other primary anæmias. Sir Dyce Duckworth, also, writing in 1886,[2] says: "Evidence is, however, accumulating to show that amongst the results of anæmia a measure of damage to the mitral and aortic valves occurs."

The chief point I have wished to make in this short paper is that bruits, indicating mitral regurgitation, occur in a considerable proportion of cases of chlorosis, and that in a small number of such cases the cardiac condition ends in permanent organic disease.

A CASE OF ELEPHANTIASIS OF THE SCROTUM.

With Remarks on its Operative Treatment.

By Christian Fenger, M.D.,
of Chicago.

Elephantiasis of the scrotum is so rarely met with outside of the tropics that to us it has little more than a theoretical interest. At the same time our relations with the surrounding tropical countries where the disease is endemic are sufficiently intimate now, and are increasing to such an extent that it is very possible that cases of this disease may be

[1] Lancet, March, 1880, p. 481.
[2] Brit. Med. Journ., July 10th, p. 57.

met with here among immigrants from these countries, as, for instance, Barbadoes, Samoa, and China.

J. E., twenty-three years of age, German, was admitted to the German Hospital, Chicago, in January, 1891. He was born in Strasburg, of German parents, both of whom are in good health. He has three brothers and four sisters, all in good health. When he was six years old he came with his parents to Chicago, and a few years later moved to a farm at Rose Hill, one of the suburbs of that city. With the exception of the usual diseases of childhood, and a rather severe attack of typhoid fever three years ago, from which he recovered perfectly, he has always been healthy.

His present ailment, the elephantiasis, commenced eight years ago without any apparent cause, as a slight enlargement of the scrotum, followed later on by thickening of the prepuce. The enlargement increased gradually and uniformly, with no intermission. There was never any pain nor symptoms of inflammation—that is, erysipelatoid attacks in the enlarged scrotum—according to his statement. About four years ago he suffered for some time from frequent micturition and urinary tenesmus, which, after a while, subsided. Two years ago, without any cause so far as he knew, he had swelling and pain in the inguinal glands on both sides above and below Poupart's ligament, accompanied by pain, and followed in a short time by suppuration. This terminated in two or three abscesses on each side, which were permitted to open spontaneously, and after discharging for some time the opening definitely closed.

Several years ago he was obliged to have trousers especially made on account of the scrotal tumor. In spite of the size and weight of the tumor, however, he has been able to work as driver of a wagon for a railroad company with satisfaction up to this time.

On examination he was found to be robust, well nourished, of healthy appearance and color. Thoracic and abdominal organs normal. Muscular strength and development normal (Fig. 1). The scrotum was enlarged and formed a tumor weighing twenty-two pounds, extending down an inch below the knees. The skin was nodular, here and there covered with scales and crusts of dried epithelium. The nodular prominences were somewhat harder than the remainder of the skin. The tumor was of a uniform firm, leathery consistence. Pressure with the fingers did not leave any indentation as in œdema. The skin was thickened so that it could not be lifted up in a fold. On the anterior upper surface of the tumor was seen a second round tumor, about the size of a fist, on the right side of which was a vertical furrow two inches long, through which a probe could be passed upward into the tumor a distance of four inches. This was the opening of the prepuce, through which the patient urinated, the urine dribbling down over the large tumor. The skin over this enlarged prepuce was hard and nodulated, as was the skin of the scrotum. There were no hairs on the scrotum. The pubic hair was sparsely developed. At the junction of the scrotum with the pubic region the skin was softer and not nodulated, but still somewhat thickened and immovable, as if œdematous.

This part of the tumor formed a sort of pedicle six inches wide and three or four inches thick. Neither the testicles nor the penis could be made out.

The inguinal glands on both sides were enlarged to the size of a small walnut, as were also the glands in Scarpa's triangle. On the right side three cicatricial depressions—scars after the old abscesses—could be seen, one below and two above Poupart's ligament; and on the left side two similar scars. There was no enlargement of the deeper glands along the external iliac vessels.

The skin at the upper part of the inside of the thigh and the corresponding skin of the outer part of the tumor was the seat of intertrigo, the surface denuded, red and moist, partially covered with a whitish, fetid smegma. This surface inflammation caused the patient no pain,

FIG. 1.

FIG. 2.

itching, or other inconvenience. There were no enlarged lymph-glands in any other part of the body, and no œdema of the lower limbs, on which, as well as elsewhere on the body, the skin was perfectly normal.

Urine normal. Repeated examinations of the blood at different times of the day and night showed no filaria and nothing abnormal. Appetite good; bowels regular. His mental condition was somewhat abnormal; he was melancholy and morose, did not want to talk with anyone, was not very willing to answer questions, but otherwise appeared to be sufficiently intelligent.

For two weeks previous to the operation antiseptic dressings were applied and local treatment directed to the excoriated surface between the thigh and scrotum, so as to heal the superficial inflammation of the skin at this point and as a further preparation for the operation.

On the day previous to the operation the patient was given a sublimate bath, and on the morning of the operation the tumor was held up in an elevated position for an hour in order to deplete the vessels of blood.

The patient was anæsthetized and the tumor held up by two assistants, and a Turner's clamp, which I had had made to secure bloodless operating, applied over the uppermost part of the pedicle, a careful examination having first been made for inguinal hernia, which showed that no such complication existed.

A grooved director was now introduced into the sinus of the prepuce leading to the glans penis, and the overlying wall of skin divided upon it until the glans penis was exposed about three inches above the peripheral opening.

Flaps of skin were now cut as follows: The anterior surface was divided into three equal parts and three semilunar flaps cut, the median being a little larger than the two lateral flaps—each lateral flap being about two inches long and two inches broad, the median flap of the same breadth but two and one-half inches long. The two lateral flaps were intended to cover the testicles, the median flap to cover the penis. A single posterior flap was then cut through the skin, about two inches long and six inches broad; that is, the whole width of the posterior surface of the neck of the tumor. The cutaneous flaps were then dissected up to the clamp. The penis was next dissected out of the tumor, leaving about one inch of preputial mucous membrane all around the glans. The skin in this region was somewhat thickened and œdematous, but reasonably movable and pliable. The left testicle was now sought for and found without much difficulty, the tunica vaginalis communis being surrounded by a looser layer of somewhat œdematous tissue, which permitted the isolation of the testicle covered with the tunica vaginalis communis, and the spermatic cord, which was then dissected up to the clamp. The right testicle was now isolated in the same way.

Both testicles and the penis, together with the three anterior flaps, were held up toward the abdomen over the upper arm of the clamp, covered with carbolized gauze, and the neck of the tumor was ablated by a series of cuts. After dividing each portion, all visible vessels were ligated, including a number of veins two to three lines in diameter.

When the ablation of the tumor had been finally completed and all visible vessels ligated, the clamp was loosened a little at one end, whereupon a number of bleeding vessels appeared, which were taken up and ligated one by one. In all, more than sixty ligatures to large and small vessels were applied. All bleeding-points in each portion cut were ligated before the next portion was divided.

The clamp was then removed, and the hemorrhage having entirely ceased, the wound was irrigated with two and a half per cent. solution of carbolic acid and the flaps united in the following way:

The two lateral flaps were united to the lateral portion of the posterior flap over each of the testicles, and the median anterior flap and the middle portion of the posterior flap made to cover the penis by stitching the lower end to the prepuce above the glans penis. The glans penis was uncovered, and although there was no tension in the covering of the body of the penis when not in a state of erection, I should in a future case like to make the median anterior flap and the middle portion of the posterior flap about an inch longer, because the skin and the prepuce were here somewhat thickened and stiff, and thus not as mobile and flexible as in the normal condition.

Three short drainage-tubes, one for the penis and one for each testicle, were inserted and stitched to the border of the wound, and a dry iodoform dressing applied.

The wounds healed without suppuration, pain, or rise in temperature. After a week the drainage-tubes were removed, and in four weeks the granulating surfaces at the point of insertion of the drainage-tube and at one side of the penis, where the union between the skin and prepuce had reopened a little, were entirely healed over. As will be seen from a photograph taken six weeks after the operation (see Fig. 2), the shape of the external genitals is comparatively normal, and the following condition is now present:

The glans penis is plainly visible, protruding below the scrotum. On the left side the skin of the penis is normal; on the right, above the glans penis, there is an œdematous fold which is rapidly decreasing in size and becoming softer. The left half of the scrotum is of almost natural shape and size; the right half not so much so, but both testicles can easily be palpated in the normal position, behind the penis. The skin at the root of the penis in the pubic region is a little thicker than normal, and is still a little more voluminous than normal, but nearly approximates the natural shape. Both inguinal regions are somewhat enlarged on account of the swelling of the subjacent lymph-glands, as will be seen in Fig. 2, where the depressions due to the somewhat retracted scars over the openings from the glandular abscesses of two years ago are plainly visible.

Urination normal. As to the sexual function, I know nothing at present. His mental condition is widely different as compared with his condition prior to the operation. Instead of his former morose and non-communicative behavior, he shows now a bright and smiling countenance, and, without being invited to do so, states that his present condition is one of great happiness as compared with the period before the operation.

Microscopical examination of the structure of the tumor from the skin downward shows thickening of the epidermis and papillary layer, but the epithelial cells are of normal shape and size. There is no line of demarcation between the cutis and the subcutaneous tissue, the entire tumor consisting of a wide, semi-solid, elastic mass of tissue, which shows under the microscope the following characteristics:

Large areas of thick bundles of non-fibrillar connective tissue: the bundles in some locations running parallel to each other, and in other places interwoven and cut obliquely or transversely. Between the bundles may be seen occasional and rare connective-tissue corpuscles of normal size and shape. The vessels, arteries as well as veins, but especially veins, show an enormous thickening of the walls, the smaller veins having walls five to ten times the normal thickness. This thickening is mainly an enlargement of the external coat, the endothelium not participating at all in the thickening of the wall. In the perivascular spaces are seen here and there conglomerations of leucocytes; in other places no young cells are to be seen at all. Islands of young granulation tissue, consisting of embryonal cells densely packed together and having the same appearance as the cells in ordinary young granulation tissue, are spread all over the connective tissue. These islands differ greatly in size. I was unable to find anywhere enlarged lymph-spaces or lymphatics, but am inclined to believe that some of the

islands occupied by embryonal cells, in which no bloodvessels could be seen, are lymph-vessels or lymph-spaces in a state of plastic inflammation.

Elephantiasis of the scrotum (elephantiasis Arabum) is anatomically identical with elephantiasis of other parts of the body, whether affecting the scrotum, prepuce, labia majora or the lower extremities. We find in all cases, irrespective of the etiology, an increase in all the constituent elements of the skin and subcutaneous tissue, with the exception of the hair and the glands. Thus we find thickened epidermis and inter-papillary spaces of the epithelium, enlarged papillæ and connective tissue of the cutis. The enlargement here and in the subcutaneous tissue is due to a universal formation of new connective tissue. This new formation of connective tissue in the vessel wall, chiefly in the external coat, produces the characteristic thickening of the vessels to five or ten times their normal size. It also produces a thickening of the nerves by a similar increase of interstitial tissue between the nerve bundles.

We find in the lymphatics in the later stages of elephantiasis, as in the case reported, no very characteristic dilatation. It is different in the earlier stage of elephantiasis of the scrotum, the so-called "lymph scrotum," where the tissue is still soft and œdematous. Here we find lymph-vessels and lymph-spaces dilated, sometimes to such an extent that when situated at the surface of the skin they may form thin-walled, transparent bullæ on the surface of the tumor, which may burst and empty a clear or milky lymphatic fluid, which sometimes escapes in great quantity and may cause a temporary decrease in the size of the tumor.

The condition of the lymph-glands is important. It is common to find, as in the above case, a considerable enlargement of the glands, an inflammatory enlargement, which, when due to invasion of pus microbes from an abraded surface on the scrotal tumor, may terminate in suppuration.

The etiology of elephantiasis is still shrouded in mystery; this is especially true in the non-parasitic forms of the disease. Etiologically there is a great difference between the elephantiasis found in tropical countries and the variety of the disease seen in temperate and cold regions. In tropical countries the disease is uniformly ascribed to a parasite belonging to the class of nematodes, namely, the *Filaria Bancrofti*.[1] This filaria, a thin, white worm, three to four inches in length, and as thick as a human hair, is found in the lymph-vessels of the area of the elephantiasis. Here it deposits its thousands of eggs, out of each

[1] B. Scheube: "Die Filaria-krankheit." Volkmann's Sammlung klin. Vorträge, 1883, No. 232.

of which is developed an embryonal worm small enough to pass through the capillaries. This worm is periodically found in the blood of patients suffering from this disease, and is the so-called *Filaria sanguinis hominis*. It is supposed that the mature animal, as well as the ova and embryos, may cause on the one hand, by accumulation in the lymph-vessels and glands, stoppage of the lymph-current and consequent œdema in the corresponding distal territory; and on the other hand, by chemical products of their excretions, they may cause inflammation of the lymph-vessels, a plastic lymphangitis, which naturally would tend to further obstruct the lymph circulation. This may, perhaps, account for the repeated attacks of erysipelatoid inflammation in the territory of the elephantiasis.

This parasite, also, whose life history and relation to elephantiasis have been studied so carefully by Wucherer in Brazil, Lewis in Calcutta, and especially by Manson, father and son, and Myers in Amoy, and whose method of entering the human body has been studied by the last-named authors and by my friend of former years, Prospero Sonsino, of Egypt, is commonly found in our Gulf States, as has been shown in an excellent paper by Mastin, of Mobile, and confirmed by Matas, of New Orleans, and others.

It is natural, then, to find elephantiasis a common, and in some places an endemic, disease in tropical countries, to which the filaria of Bancroft is geographically limited. In some localities, as for instance Samoa, the disease is so common that, according to Turner, 50 per cent. of the adult population will, sooner or later in life, have the disease. The filaria and elephantiasis have probably been imported into islands comparatively near our coast by coolies from China, as, for instance, Barbadoes, where the disease has become endemic.

But the filaria Bancrofti is not the only cause of elephantiasis, for sporadic cases of this disease in the scrotum, as well as in the lower extremities, are found in temperate and cold countries where the filaria does not exist, and are found in patients, as in the case here reported, who have never been in places where they could have been exposed to the invasion of the parasite. As would naturally be expected, the parasite is never found in these patients. Cases of this kind have been reported in England by Fergusson, in France by Velpeau, in Germany by Graefe, in Switzerland by Bircher, and also by other observers.

Clinically and anatomically there seems to be no difference between the elephantiasis of the tropics due to the filaria, and the elephantiasis in the temperate zone where no filaria is found. The changes in the lymphatic system, erysipelatoid inflammations in the lymph-spaces of the skin, and swelling of the lymph-glands, are characteristic of both classes of the disease. This swelling of the lymph-glands does not necessarily mean obliteration of the lymph-current, as stated by Kocher

in his excellent monograph on diseases of the male genital organs,[1] for in a case of elephantiasis published by Bryk, the enlarged lymph-glands were permeable and the lymph-vessels dilated, even as far as the thoracic duct. Swelling of the lymph-glands, according to Kocher, often precedes the development of elephantiasis, and is supposed to play an important part in the etiology of the disease, both within and outside of the tropics. But it is entirely unknown why so common an affection as enlargement of the lymph-glands should result in elephantiasis in such exceedingly exceptional instances as we find to be the case.

Symptoms.—Elephantiasis of the scrotum is usually of a softer consistence than when the disease exists in the legs, but the swelling increases more rapidly. Soft and œdematous at first, the so-called lymph-scrotum, it gradually becomes harder. The unequal thickening of the epidermis causes the surface, which was originally smooth, to become nodular and irregularly corrugated. The increase is not uniform, but intermittent, following the repeated inflammatory attacks. These attacks are characterized by redness and swelling, but are attended by very little pain, the skin over the tumor being to a greater or less extent anæsthetic. Atrophy of the sebaceous glands and hair-bulbs is followed by falling out of the hair. Here and there scales of thickened epidermis and crusts of dried secretion from abraded surfaces or from ruptured dilated lymph-vessels cover smaller or larger areas over the tumor.

By the increase in the size of the tumor the testicles are buried, so that after a while their location cannot be detected except when hydrocele coexists. The increase in size of the prepuce, together with the increase in the skin of the scrotum, makes the penis disappear, the skin being drawn downward and forward in front of the glans, forming a sinus sometimes several inches long leading up to the urethra, surrounded by a separate tumor like a smaller appendix on the anterior surface of the large tumor. A deep furrow is usually seen on the end or on one of the sides of the transformed prepuce, which forms the entrance to the urinary sinus through which the urine dribbles down during micturition over the tumor, which probably helps in the causation of the maceration of the epidermis and the surface inflammation.

As the elephantiasis is on the whole painless, the chief inconvenience to the patient is caused by its weight. Tumors of thirty to fifty pounds in weight are commonly seen, and a tumor weighing one hundred pounds has exceptionally been observed. This, however, does not influence the general health of the patient, who is, as a rule, as in the case cited above, able to do manual labor, notwithstanding the presence of the large tumor.

[1] Theodor Kocher: "Die Krankheiten der männlichen Geschlechtsorgane." Deutsche Chirurgie, von Billroth und Luecke, 1887.

The *prognosis* is good, and it is only in exceptional cases that danger arises from septic inflammation on the surface of the tumor, with gangrenous destruction of a portion of the inflamed area and resultant general sepsis.

Treatment.—Elevation of the tumor, compression, warm, moist applications, local mercurial inunctions, in connection with the internal use of the iodides, iron, chlorate of potassium, and bichloride of mercury, have proved successful in exceptional cases only, and then in the earlier stages alone.

Non-radical treatment is, of course, of far more importance in elephantiasis of the lower extremities, where amputation should be deferred as long as possible, than in elephantiasis of the scrotum, where early operation is so much the more admissible, as no mutilation of the genital organs is caused by it.

The dangers of the operation in elephantiasis of the scrotum are hemorrhage and sepsis. For this reason, in former times, partial excisions and operations with the écraseur or galvano-cautery were resorted to, but these procedures have now become entirely obsolete.

The prognosis of the operation, which in pre-antiseptic times was comparatively grave, has gradually lost its dangers. Thus we see, from Kocher's statistics, an early mortality of twenty-seven per cent. in sixty-one cases reported by Fayrer; of nine and one-half per cent. in twenty-one cases reported by Ballingall; of five per cent. in one hundred and sixty-one cases reported by Esdaile; of three and three-tenths per cent. in sixty-one cases reported by Manson; and more recently one and one-half per cent. in one hundred and thirty-eight cases reported by Turner. The better prognosis of the operation in Turner's cases is due to asepsis as well as to the great improvement in the technique of the operation. Therefore, in the case above reported I adhered strictly to the method of operating as laid down by Turner. Hæmostasis is made absolute by the use of Turner's clamp, which has been already mentioned.

Perfect covering of the penis and testicles is secured by the flaps as devised by Turner and described in my operation, thereby avoiding sepsis from non-union of a large wound surface, as in the older operations, in which for fear of hemorrhage the tumor was cut off transversely, or in which sometimes the penis and testicles were removed with the tumor and the large wound surface left to heal by granulation.

The bloodless operation, by means of the clamp or elastic constriction, gives the operator time to carefully dissect out the penis, testicles, and spermatic cord, and to open and radically operate upon hydrocele, if present. The clamp is preferable to an elastic constrictor, because the latter is, as stated by Kocher, very liable to slip off during the separation of the tumor, while the clamp can be gradually loosened one end at a time, admitting ligation of the smaller vessels step by step. This

makes the operation with the clamp, notwithstanding the numerous and very large vessels, almost entirely bloodless.

The removal of the penis and testicles can in all probability be always avoided by Turner's operation, and should at least be always attempted, although Esdaile regards it as dangerous not to remove these organs in tumors which weigh more than fifty pounds. In two cases reported by Lloyd, tumors of sixty-five and sixty-one pounds in weight, respectively, were successfully removed with preservation of the penis and testicles. In these operations soft twisted ropes were used as constrictors and the flaps made according to the method of Turner.

The preservation of the penis and testicles is the more important because the genital functions remain undisturbed in the case of patients suffering from elephantiasis.

RESPONSES TO THE ALTERNATING GALVANIC CURRENT IN NORMAL AND DEGENERATE MUSCLES.

By M. Allen Starr, M.D.,
of New York,
and
Charles I. Young, A.B.,
the Observatory, Princeton, New Jersey.

I.

By Dr. Starr.

The following article presents in a concise form the results of a scientific investigation upon the effects of an alternating galvanic current of electricity upon normal and degenerate muscles. The research has been made by one who is thoroughly conversant with all recent advances in the knowledge of electricity and of all its mechanical appliances, and who has had exceptional facilities at Princeton for the prosecution of careful experiments by the aid of the best apparatus. Mr. Young is a practical electrician, who has been for three years recovering from a condition of acute anterior poliomyelitis of considerable extent, produced by the passage of an alternating current through his entire spinal cord. His treatment has been partly mechanical, various devices for exercising paralyzed muscles having been made and used by him with success; partly electrical, the muscles being daily stimulated by alternating currents of moderate strength in the manner described by him; partly medicinal, by arsenic and strychnine, with results whose effects have been objectively proven by electrical tests in the

manner presented in this paper. The results reached appear to be of importance in confirming Neumann's statements regarding the physiology of muscular response to electrical stimulation; in presenting a series of facts regarding the effect of the application of alternating currents to muscles, not as yet investigated; in determining the possibility of reaching prognostic facts of great value in doubtful cases by electrical tests with the alternating current; and, finally, in demonstrating the effect of strychnine and arsenic on the nervous functions.

Erb says (Ziemssen's *Cyclopædia*, Amer. edit., vol. xi. p. 433), "the extraordinary fact that in the reaction of degeneration the muscle fails for a long time to react to the stimulus of the faradic current while it readily responds to the galvanic stimulus has been explained by Neumann in the following satisfactory manner: 'Muscles,' he says, 'that have undergone this pathological change have simply lost the power of responding to currents of momentarily short duration, while they react in an increased and qualitatively altered manner to currents of longer duration. But inasmuch as faradic currents are, without exception, currents of only momentary duration, the muscles do not react to them. . . . The value of the change by which the muscular tissue loses its normal power of reacting to currents of short duration is a question the solution of which must be left to physiologists.'"

Mr. Young has shown that the length of duration of stimulus required to cause contraction in a paralyzed muscle varies in accordance with the degree of progress toward recovery; varies also in accordance with the subjective feeling of strength; varies also in dependence upon the use of strychnine in interrupted or continuous dosage.

The practical result of his investigation is to enable a physician by careful measurement to construct a prognostic curve which will enable him to give certain hope of recovery to a patient completely paralyzed, or will establish the unfortunate fact of a permanent loss of power. It also makes it evident that in using arsenic or strychnine as a stimulus to the spinal cord it is better to give the drug for short periods with intermissions than continuously.

The accuracy and care of the investigation and the importance of the conclusions arrived at should attract the attention of physiologists, and especially of neurologists, to this contribution to medical science.

II.

By Mr. Young.

Certain nervous diseases are followed by a loss of voluntary contraction in the muscles, and in such muscles we sometimes notice electrical reactions which present a marked contrast to those of muscles in their normal condition.

A normally healthy muscle responds to the rapidly interrupted current from the faradic coils, and the muscle remains permanently contracted as long as the current is applied.

On applying the perfectly steady current of a galvanic battery we find the following effects: With the negative electrode on the muscle, and the positive anywhere on the body remote from the muscle, we get a contraction at the moment the circuit is completed; but this contraction, unlike that produced by faradism, is not tetanic. If we now interchange the electrodes we find that the muscle responds also to the positive pole of the battery, but not so strongly as to the negative. We again notice that, during the interval between making and breaking the circuit, the muscle tends to return to a state of rest.

On applying the above tests to a degenerated muscle we find, first, no response whatever to the faradic current. In the second place we find the responses to a galvanic current appearing in reverse order; viz., while a healthy muscle responds more vigorously to the negative than to the positive electrode, on completing the circuit, the degenerated muscle responds more vigorously to the positive; and these reactions, in the case of a degenerated muscle, are again reversed on breaking the circuit.

If we now examine a muscle which is regaining its power after being paralyzed, we may find the response to the positive pole of a galvanic battery the stronger; the responses to positive and negative may be equal; or that to the negative may be the stronger, as in the case of a normally healthy muscle. On applying the faradic current we may find no response, a response to but one of the electrodes, or a response to both, according to the condition of the muscle and the strength of the current applied.

It is well known that the faradic coil does not give a true alternating current. The current is strong in one direction and weak in the other, so that one electrode is a strong positive and weak negative, while the other is a strong negative and weak positive.

The writer, who has been able to supply the muscles for testing in his own person, has at different times found all the responses referred to above. Where a muscle has responded to but one electrode of the faradic coil it has invariably been to the strongly positive; but in such a case it has sometimes been possible to obtain a response to the strongly negative by increasing the strength of the current. As might be supposed, that muscle has shown a stronger response to the positive pole of a galvanic battery than to the negative.

Dr. Starr, in his article on "Therapeutic Uses of Electricity,"[1] says: "The difference of response to the faradic current from that of

[1] The Medical News, March 30, 1889.

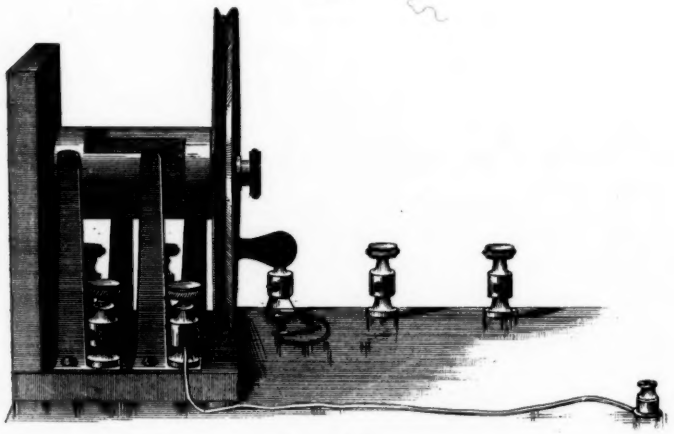
voltaic alternatives, in conditions known as the reaction of degeneration, is not to be ascribed to any difference in the nature of the current, but only to the fact that the degenerated muscle will not respond to changes of state so rapidly produced."

There must be a certain amount of lag in the response of any muscle to an applied electro-motive force, though in the case of a healthy muscle it must be very small, and probably would have to be measured in thousandths of a second, if not in some smaller unit. But in a degenerated muscle it would appear that this lag amounts to something appreciable. If, by means of a suitable commutating device, we apply voltaic alternatives to such a muscle, and have some means of measuring the rate of alternation at which the muscle ceases to respond to a given current, we can ascertain the lag of that muscle's response behind the applied electro-motive force.

It has occurred to the writer that this test might possibly give some knowledge of the condition of a degenerated muscle, and with this end in view the following apparatus was assembled:

First, a rotary commutator (Figs. 1 and 2) to give voltaic alternatives. For every revolution of this commutator the current is reversed six

Fig. 1.

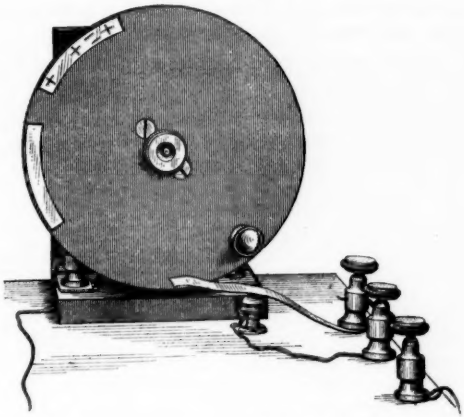


Commutator.

times. The pulley wheel of the commutator is four inches in diameter and is driven from a half-inch pulley on a small electric motor (Fig. 3) Current is supplied to the motor from a storage battery; and by means of a variable resistance the motor can be made to run at any speed from about 500 to over 6000 revolutions per minute.

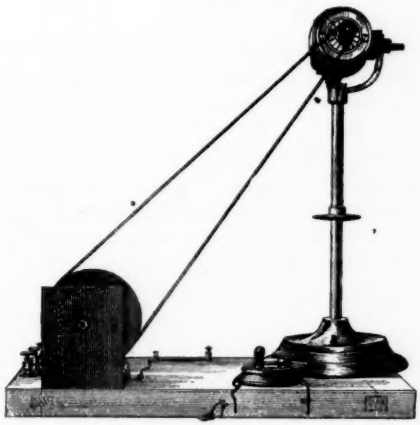
The speed of the commutator is recorded automatically on a chronograph, which may be thrown in and out of circuit at pleasure by a switch placed within easy reach (see Fig. 3, near the base of the motor).

FIG. 2.



Commutator, with arrangement for completing chronograph circuit at every revolution of wheel.

FIG. 3.



Commutator and motor.

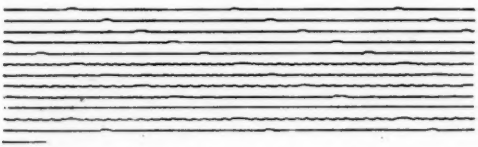
The chronograph (which is near at hand in the astronomical observatory of Princeton) records every other second from a standard clock.

The recording of the commutator revolutions is effected in the following manner:

On referring to Fig. 2 there will be seen, at the base of the commutator, a projecting tongue of brass, so placed that at every revolution a little knob on the commutator wheel strikes it and depresses it, causing it to come in contact with the head of a screw placed beneath. This, when the switch (referred to above in Fig. 3) is closed, completes the chronograph circuit, so that each revolution of the commutator wheel is recorded.

Fig. 4 shows the appearance of a record made by the chronograph. The first five lines show the clock record alone. In the lines below each

FIG. 4.



Fragment of chronograph sheet showing clock record, together with records made by commutator when run at different speeds.

little tooth stands for one revolution of the commutator. Now, as there are six reversals of the current for every revolution of the commutator, it is a simple thing to compute the number of reversals per second from the chronograph record.

The current which we apply to the muscle in our test is supplied by a battery of Leclanchè cells giving about 40 volts, is regulated by a liquid resistance which we can vary at pleasure from about 30,000 ohms to less than 1 ohm, and is measured by a milliampère-meter. In connection with the milliampère-meter is a switch to cut it out of circuit when the commutator is turning. It may be well to mention the fact that the resistance of the milliampère-meter is so small compared with the total resistance of the circuit that our cutting it out changes the value of the current by only an inappreciable amount.

In the following tests the electrode placed on the muscle we wished to examine was circular in shape and about three-fourths of an inch in diameter.

Test on biceps of right arm. This muscle has lost all power of voluntary contraction. In it we find the usual phenomena which accompany degeneration, viz., no response to faradism, and with the galvanic current a stronger response to the positive than to the negative pole. We apply the small electrode to the muscle at the motor point, the other electrode, a sponge, being placed on the left arm near the shoulder. On adjusting the variable resistance to give a current of about ten

milliampères through the muscle, and setting the commutator in motion, we find the effect of the voltaic alternatives is as follows:

(*a*) We start at a low rate of speed and find the muscle responds separately to each reversal of the current.

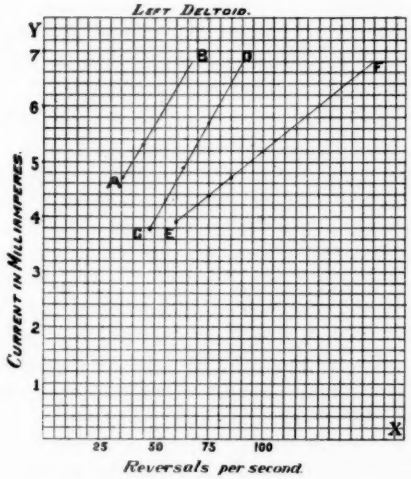
(*b*) At a higher rate of speed the muscle becomes permanently contracted and begins to lift the forearm, and the arm is held up as we increase the speed up to a certain point.

(*c*) We still increase the speed, little by little, and we now observe the muscle gradually relax; the arm sinks down; and at last we attain such a speed that, on breaking and making the circuit by means of a suitable key, we find the muscle refuses to make the slightest response to the current alternating at such a rate.

To show that the sinking down of the arm, observed at *c*, was not due to fatigue of the muscle, we have the circuit closed and gradually reduce the speed of the commutator. The muscle begins to contract as the rate of alternation grows less; the forearm is again lifted and held up for a while; the muscle begins to relax, and the arm gradually sinks down again; and, at the end, the muscle contracts separately for each reversal of the current. In short, the phenomena *a*, *b* and *c* appear again, but in reverse order.

On making the above test with currents of different strength, we find that the rate of alternation at which the muscle ceases to respond varies

FIG. 5.



A B, from test made October 22d.
C D, " " December 25th.
E F, " " February 25th.

with the strength of the current used. This being so, by making three or more tests on a muscle for disappearance of contraction, with dif-

ferent strengths of current, we can plot the whole result on cross-section paper, and draw a line which may, perhaps, tell us something about the condition of the muscle at the time the test was made. Fig. 5 shows three such lines drawn from tests made respectively October 22d, December 25, 1890, and February 25, 1891, on the left deltoid. The condition of that muscle was practically the same as that of the biceps of right arm. As will be seen, the current, in milliampères, is plotted on the axis of Y, and the rate of alternation (reversals of current per second) on the axis of X. The lines A B, C D, and E F, represent respectively the October 22d, December 25th, and February 25th tests, and demonstrate an increasing power of response in this muscle to the alternating current.

Let us, for brevity, call the rate of alternation at which the muscle ceases to respond to a given current, the *critical rate* for that current. On referring to Fig. 5 it will be seen that, in the line A B, the critical rate for a current of 5 milliampères is about 41; in C D, for the same current, it is about 64; and in E F about 93. Of course the critical rates for any other current can also be compared by a glance at the three lines given in the figure.

In a series of tests made on the right and left deltoids, and covering a period of about five months, the changes in the critical rates have been anything but uniform, and the two muscles have not always varied alike. But the writer has noticed that on days when he felt energetic and "full of snap," so to speak, the critical rates were generally higher than those of the preceding tests; and on days when there was a feeling of lassitude the critical rates were generally no higher than those of previous tests, and they were often lower.

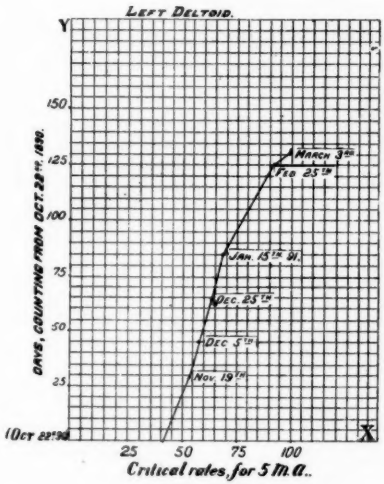
Now, to combine a series of tests in a single line, suppose, for example, we measure off time, in days, on the axis of Y, and the critical rates for some given current on the axis of X. The line we get may be called a graphic representation of changes in the condition of the muscle tested, with respect to electrical reaction, during the interval between the first and last test. If the line incline to the right there has been a gain; if it be vertical, no gain; and if it incline to the left it indicates a loss. In Fig. 6 we have drawn such a line from tests made on the left deltoid. The line demonstrates the progress toward recovery in that muscle.

After the experience gained in following up a large number of muscles by the critical rate test, it seems evident that it might be possible to draw what could be called, in general, a prognostic line of a given muscle, after a certain number of tests had been made on that muscle at stated intervals.

While the tests given here are merely tentative, and have been made without any former experience to guide us, they seem to make it obvious

that, given a degenerated muscle which will not respond to faradism, but will respond to a current alternating at a much slower rate, we can ascertain the rate of alternation at which the muscle first ceases to respond to a given current, by beginning at a slow rate and gradually

FIG. 6.



Prognostic line.

increasing. It is also clear that this rate varies with the strength of current applied, being higher for a stronger current and lower for a weaker; and the fact that the different points in each test in Fig. 5 lie so nearly in the same straight line makes it look as if this rate varied *directly* with the strength of current, at least within the limits of these tests.

We, moreover, think we are justified in assuming that if, with a given current, a healthy muscle will respond to a rate of alternation which will not affect a degenerated one, an increase in the rate to which the degenerated muscle will respond shows increased susceptibility in that muscle, and a tendency to approach, in some way, the condition of a healthy one.

We have noticed incidentally a coincidence between a change in the electrical response and the use of medicine (acid. arsen. $\frac{1}{80}$, strych. $\frac{1}{60}$, t. i. d.). It has seemed that we got a better response of the muscles from about the third day after beginning the medicine and that this improvement continued about a week; after which time the response

seemed to be less vigorous. This can be seen by a study of the following table. This also shows that the cessation of the medicine after it had been taken for a month continuously was followed by an increase in the response. It seemed, therefore, that better results were secured by taking the medicine for ten days and intermitting for ten days than by taking it continuously.

Responses of the Left Deltoid Muscle.

	Critical rates.		
	With 3.8 milliampères.	With 4.7 milliampères	
October 22,	22	36	No medicine.
November 13,	38	48	Medicine from November 5th to
" 19,	47	53	December 3d.
December 5,	36	53	Medicine stopped.
" 10,	45	58	
" 17,	38	52	
" 25,	48	62	
January 2,	53	62	
" 8,	33	47	Medicine from January 6th to
" 15,	60	76	February 2d.
" 26,	47	51	
February 2,	57	78	
" 9,	53	69	Medicine stopped.
" 19,	62	95	
" 23,	53	80	
" 25,	54	84	Medicine from February 24th to
March 3,	63	95	March 10th.
" 10,	52	83	Medicine stopped.
" 16,	60	87	
" 18,	54	77	

The writer, making no claim to medical knowledge, feels some diffidence in approaching the medical profession with an article upon a subject which lies within their peculiar province. But having good reason to be interested in the subject of degenerated muscles, and being also more or less familiar with the handling of electrical apparatus, and having the chronograph and most of the other appliances at hand, he undertook to test his own muscles by this method. The results obtained seemed so interesting that, at the suggestion of Dr. Starr, the method is here given.

THE POSSIBLE RESULTS OF CÆSAREAN DELIVERY,

As Shown by the Marvellous Record of Leipzig, Germany, for the Years 1880 to 1891, under Seven Operators, and as the Result of Improved Methods, Timely Resorted to.

By Robert P. Harris, A.M., M.D.,
of Philadelphia.

No one living writer has done so much to disseminate a knowledge of the past in puerperal cœlio-hysterotomy in all countries and to reduce the mortality of the operation itself by improved methods as Dr. Max Sänger, of Leipzig, who, upon August 20, 1880, inaugurated with success, in a very unfavorable case, the "New Cæsarean operation," as it is usually performed to-day. It is not generally known that he was led to prepare his monograph, *Der Kaiserschnitt bei Uterusfibromen nebst vergleichender Methodik der Sectio Cæsarea und der Porro-operation*, in 1881, because of an experience with a then novel plan of treating the uterine wound, by which he became one of seven operators out of forty-one who each saved a case in a list of forty-three, where the Cæsarean operation became a necessity because of an obstruction due to a uterine fibroid. This valuable paper of two hundred pages is a mine of wealth to anyone who wishes to compare the present with the past of Cæsarean surgery, and no one can better appreciate the labor bestowed upon it than the writer of this present paper, who has himself had some experience in the same line of arduous research. In this monograph Dr. Sänger devotes over ten pages to a full report of his first Cæsarean case, from which we learn that he introduced six strong carbolized silk sutures at equal distances nearly through the uterine walls and then intermediately four superficial ones, taking in a portion of muscular tissue, the serous coat being applied to serous coat all along the wound ("Serosa lag überall an Serosa"); these being tied, there was no gaping between them and no escape of blood.

Fearing that this mode of closure might not be sufficient in all cases to prevent the escape of fluid from the uterus, Dr. Sänger proposed to use a much larger number of stitches, to exsect a portion of the muscular edges of the wound, and to welt in the peritoneal coat in tying the superficial sutures. This plan, proving a great success in the hands of Leopold and others, was given, out of compliment to its proposer, the name of the "Sänger operation." In time it became evident that the resection of the muscularis and the dissecting up and welting in of the peritoneum were not absolutely essential to success, and the operation was simplified by leaving them out—first the resection, and then, in ordinary cases,

the welting in. These changes, in the view of many, eliminated from obstetric surgery the Sänger operation; but has it changed his title to his original method of treating the uterine wound? We are not partial to calling operations by the names of their originators, but are satisfied that there is still a *Cæsarean operation after the method of Sänger.* We may call all the operations "new Cæsarean" in which asepsis, multiple suturing in two rows, with careful adjustment of the serosa, and the use of carbolized silk, silver wire, or chromic catgut, is employed. But who did the most to bring these steps into use and to make known their value to the world? Everyone is supposed to know what the "old Cæsarean operation" was, and what a frightful mortality it had, except where it happened to have been performed early and upon healthy women. Suturing the uterine wound was a grand step—but how timid men were in doing it! One stitch, sometimes two or three, and very rarely five. They were apparently more afraid of doing it than leaving a gaping wound as an exit for poisoning fluid to escape through into the peritoneal cavity. It will be of interest to examine our American suture record down to August 20, 1880, and see what material was used, how many stitches were taken, and how the case terminated:

Here we have an array of cases, some of which might be placed in contrast with that of Dr. Sänger of the year 1880. The first to use as many as ten uterine sutures was Dr. T. A. Foster, of Portland, Maine, on May 23, 1870; but these stitches were all deep and their ends were brought out of the abdominal wound. Then we have the operation of Dr. R. O. Engram, of Montezuma, Georgia, following a craniotomy, on September 18, 1874, but not reported until October, 1885. In this case carbolized silk sutures to the number of ten were used in the uterine wound, of which three were deep, three semi-deep, and four peritoneal. This operation saved the woman, but lost its value to the profession in the fact that the process was not reported until there had been twenty-six operations founded upon the example of Sänger, with sixteen women and twenty children saved. A claim to precedence now made would amount to very little in view of the advances gained under the teachings of Leipzig and Dresden. And then we have a third case, which has been really heralded as a prior claim, in which after a labor of seven hours a woman and child were saved, on May 8, 1875, under a disciple of Hahnemann, in Toledo, Ohio, five deep sutures of silver wire being used and "care being taken to approximate the peritoneal edges."[1] This word "edges" was subsequently altered to "surfaces," with a pen; but we take the original text as we have it, which is the old surgical

[1] Silver-wire Sutures in the Cæsarean Section. By S. S. Lungren, M.D., Toledo, Ohio, 1876. Pamphlet, 13 pages.

direction of "edge to edge" in the closure of incised wounds.[1] But with only five sutures in a five-inch wound we should have little control over gaping and leakage in a Cæsarean operation following a long or exhausting labor.

Year.	Time in labor.	Material used.	Number of sutures.	Cause of death in woman.	Time of survival in woman.	Result to woman.	Result to child.
1828	15 months at intervals.	Silk.	2 or 3	Peritonitis.	To second week.	Died.	Dead.
1851	4 days.	"	?	Exhaustion.	24 hours.	"	"
1852	40 hours.	Silver.	?	R.	.....	Recovered.	"
1867	62½ hours.	Hemp.	3	R.	.....	"	Living in 1883.
1867	10 days.	Silver.	6		.....	"	Dead.
1870	44 hours.	"	1	....	42 hours.	Died.	Living.
1870	2 weeks.	Silk.	10 with the ends left out.	.....	60 "	"	Living; died in a few days.
1871	3 days.	Silver.	2	Peritonitis.	72 "	"	Dead.
1872	Long.	Silk.	1	Hemorrhage and exhaustion.	Short time after operation.	"	"
1874[2]	.....	Carb. silk.	3 deep, 3, ½ deep, 4 peritoneal	R.	.....	Recovered.	"
1875	7 hours.	Silver.	5	R.	.....	"	Living in 1889.
1875	38 hours. Membranes entire.	Silk.	1	R.	.....	"	Living.
1875	6 hours. In bad health.	"	5	Exhaustion, 15 yrs. old.	2 days.	Died.	Lived 13 days.
1876	Early.	Silver.	3	Peritonitis.	5 "	"	Dead
1877	Almost died of exhaustion in operation.	"	1	Exhaustion.	15 "	"	Lived 2 days.
1877	7 days.	"	4	R.	.....	Recovered.	Dead.
1878	Not in labor.	Silk.	7	R.	.....	"	"
1878	24 hours.	Carb. catgut	7	Heart-clot.	7 days.	Died.	"
1879	2½ days.	Silk.	3	Probably hemorrhage	36–40 hours	"	Moribund.
1879	30 hours.	?	1	Septicæmia.	33½ "	"	Dead.
1880	3 hours.	Horsehair, silk.	9 horsehair 3 silk.	R	.....	Recovered.	Living in 1889.
1880	30 hours.	Silver.	2	R.	.....	"	Dead.
		Silk, 11 Recov. 5 Silver, 9 Recov. 5	Average, $4\frac{7}{26}$	.....	.....	Recov. 10 Died 12	Dead 13 Lived 6 Soon died 3

From ten silk sutures used by Sänger in 1880, the number gradually grew to a maximum of sixteen deep and thirty-five superficial, under Döderlein, of Leipzig, in 1887, since which time a desire to simplify has largely decreased the number without any apparent increase of risk, until Murdoch Cameron, of Glasgow, has saved nine women out of ten by the use of seven to twelve deep sutures and superficial intermediates as may be required. And Dr. Kelly, of Baltimore, saved his fourth patient, on January 16, 1891, by the use of seven deep and eight semi-deep silk sutures, going back almost to the number used in Sänger's

[1] Archives de Tocologie, Paris, Jan. 1877: "En ayant soin d'affronter les bords péritonéaux."

[2] Reported in 1885.

first case, and using them as he did. We may call this method the "new Cæsarean," the "improved Cæsarean," or, if the sexual power of the woman remains intact, the "conservative Cæsarean" operation; but it is Sänger's method in its original form notwithstanding, and antedates the first improvement by him under Leopold by twenty-one months. It will, no doubt, surprise many to learn that Prof. Sänger still has a claim to the "improved Cæsarean operation," although his main additions to the technique have disappeared from general use.

We now present the very remarkable Cæsarean record of the city of Leipzig, as furnished, under a request, by Prof. Max Sänger:

No.	Date.	Operator.	Hospital or private.	Age	Number of pregnancy.	Cause of difficulty.	C. V.	Result to woman.	Result to child.
1	Aug.20, 1880	Dr. Sänger,	Private	30	2d	Retro-uterine fibroid.	...	Recovered	Dead a month.
2	May 25, 1882	" Leopold,	Private clinic.	29	2d	Contracted pelvis.	6 cm.	"	Living.
3	Nov.16, 1884	" Sänger,	University clinic,	21	1st	" "	6–6.5	"	"
4	July 3, 1885	" "	" "	32	4th	" " relative indication.	...	"	"
5	Aug. 2, "	" Obermann	" "	42	1st	Contracted pelvis.	...	"	"
6	Oct. 20, "	" Sänger,	" "	38	4th	" "	...	"	"
7	Dec. 9, "	" "	" "	35	4th	" "	...	"	"
8	Nov.13, 1886	" Donat,	" "	34	4th	" "	...	"	"
9	Nov.18, "	" Weber,	" "	36	5th	" "	...	"	"
10	Apr. 12, 1887	" "	" "	33	4th	" "	7.5	Died of sept peritonitis.	"
11	May 1, "	Prof Zweifel,	" "	41	5th	" "	6.5	Recovered	"
12	May 3, "	" "	" "	32	7th	" "	7–7.5	"	"
13	June22, "	" "	" "	30	7th	" "	7.5	"	"
14	Aug.22, "	Dr. Döderlein,	" "	31	2d	" "	8	"	"
15	Sep. 23, "	" Obermann	" "	28	4th	" "	7 5	"	"
16	Dec. 17, "	" Sänger,	Private clinic.	30	5th	" "	6 .	"	"
17	Feb. 8, 1888	Prof. Zweifel,	University clinic.	21	1st	" "	6	"	"
18	Nov. 2, "	" "	" "	25	.....	" "	7	"	"
19	Dec. 17, "	" "	" "	31	8th	" "	7–7.5	"	"
20	Dec. 29, "	" "	" "	26	.....	" "	6.6	"	"
21	Jan. 13, 1889	" "	" "	25	.....	" "	9.5	"	"
22	Jan. 26, "	" "	" "	23	.....	" "	7.6	"	"
23	Feb. 12, "	" "	" "	26	.....	" "	7.5	"	"
24	July 2, "	" "	" "	29	.....	" "	7.5	"	"
25	Dec.21, "	Dr. Sänger,	Private clinic.	36	1st	Contracted pelvis and rupture of lower uterine segment.	8–8.5	"	"
26	Oct. 14, "	Prof. Zweifel,	University clinic,	41	.....	Osteomalacia.	5	"	Dead.
27	Dec. 31, "	" "	" "	34	8th	Second Cæsarean of Case 12.	7–7.5	"	Living.
28	June 2, 1890	" "	" "	28	1st	Contracted pelvis and eclampsia.	7	Died of uræmia.	"
29	July 9, "	" "	" "	30	1st	Contracted pelvis.	...	Recovered	"
30	Aug 14, "	Dr Hertzach,	" "	37	3d	" "	...	"	"
31	Sep. 14, "	Prof. Zweifel,	" "	23	2d	" "	8	"	"
32	Nov.17, "	" "	" "	36	2d	" "	8.5	"	"
33	Nov.30, "	Dr. Döderlein,	" "	32	3d	" "	7.75	"	"
34	Dec. 9, "	Prof Zweifel,	" "	27	1st	" "	8.5	"	"
35	Apr. 16, 1891	Dr. Sänger,	Private clinic.	21	1st	" "	6.5	"	"

Prof. Paul Zweifel now stands at the head of the Cæsarean operators of the world, having lost but one woman and one child in eighteen cases. He is a rapid operator, still uses a large number of sutures, and is par-

tial to chromic-acid catgut as a material. He has completed an operation in twenty-four minutes. The woman lost was hopelessly ill with diseased kidneys, and had convulsions before the operation; she died of uræmia in four days, during which time the wounds had nearly healed.

Dresden, under six operators, furnishes a longer list of cases than Leipzig, but with a somewhat greater mortality, from the fact that a larger proportion of the women were operated upon under desperate circumstances. Prof. Leopold has had more Cæsarean deliveries than any man living; he had lost three women when he reached the present number of Prof. Zweifel. I cannot give the full record, but the percentage of loss has been smaller than the best Porro-Cæsarean work in Europe. The Porro record of all countries for the years 1885, 1886, 1887, 1888, and 1889 amounts to 157 cases, with 48 deaths, and 25 children lost. In the year of the lowest mortality (1888) there was a loss of 15⅝ per cent., or 5 out of 37; but in the following year it rose to 32¼ per cent., or 10 out of 31.

The best Porro record in Europe taken from its beginning, is that of Milan, under eight operators. The mortality in 31 cases has been 9, with only two children lost; this makes the percentage 29 against 5⅔ per cent. in Leipzig under cœlio-hysterotomy. Vienna has had many more Porro operations than Milan, but lost 15 women out of her first 31. For the past four years, her unpublished record will show a much diminished death-rate; that of Milan, during the same period, being far higher. We may safely rate this operation as having therefore a general average mortality of 28 per cent. In the year 1887 there were 53 "new Cæsarean" operations, with 11 women and 4 children lost, or a mortality of 20¾ per cent.; and in 1888, 79 operations, losing 18 women and 3 children, or 24 per cent. The Cæsarean record shows a decidedly lower average mortality in both the women and children than that of the Porro operation. Both are capable of a considerable reduction in the death-rate, but the exsection of the uterus must always add to the gravity of a Cæsarean delivery in cases where this organ is sound and the child living. Where the child is dead and putrid, where the body of the uterus is the seat of fibroids, or where there are septic symptoms due to the condition of the uterus, the Porro-Cæsarean method is to be preferred. In exceptional tumor cases, where exsection is not advisable, the tumor should not be removed.

The "conservative Cæsarean" operation is preferred by Prof. Sänger and by many Continental operators, who are opposed to removing the ovaries or tying the Fallopian tubes, especially in a married woman, who becomes thereby not only sterile, but, in some few instances under the former, sexually changed.[1] If the danger of Cæsarean delivery can

[1] This point is in dispute, but there are certainly instances in which this occurs.

be reduced to 6 per cent.—and this ought to be reached in women previously operated upon—then the question of sexual mutilation becomes one to be very seriously weighed.

I have heard it claimed that the children of rhachitic women were of so little value that their mothers ought not to be allowed to generate. This has certainly not been the experience of this country, where rhachitic women have in many instances given birth to exceptionally fine children, some of whom are now living as adults and others as very robust babies or little children. When a rhachitic dwarf bears a fourteen-pound baby or one of twenty-two inches in length and perfect in proportion, as has happened in our country, we cannot see any evidence of inferiority. Rhachitic children are rarely such by inheritance, and if those born to rhachitic women become themselves rhachitic the disease generally arises in some defective hygienic conditions such as the parent was forced into through poverty. In the rhachitic unmarried pauper, or in the same even when married, the condition of extreme poverty may be considered in deciding the question of tubal ligation. One rhachitic woman of Ohio, whose tubes were ligated in 1880, has certainly had two fine Cæsarean children—a girl, now sixteen, and a boy, eleven—as their photographs in my possession attest. With a death-risk reduced to 6 per cent., why should such a mother not continue to bear children? This is a question also to be considered.

The two vital questions for consideration in regard to the Cæsarean operation are those of *time* and the *technique*, and these two must go hand-in-hand if the death-rate is to reach a low percentage. The woman must be in the best possible condition and the child vigorously alive, or the technique will be a weak dependence for success. We learn a positive lesson on this point from the fact that nine women out of thirteen, or $69\frac{3}{13}$ per cent., recovered after that frightful casualty, a Cæsarean horn-rip, of which we shall have more to say at a future time. What saved these women was certainly not the surgical skill, nor even the technique, for in not one was the uterus sutured. It must have been the condition of unexhausted strength and of health in the subjects. I have for twenty years been engaged in trying to prove that the operation of "puerperal cœlio-hysterotomy" is not in itself one of excessive danger, but becomes such when performed upon a woman made unfit for it by bad obstetrical management; and I believe this has been well established by the work in Leipzig, Dresden, Vienna, and in the hands of certain private operators, as also by my researches in the abdominal and uterine lacerations under casualties in pregnant women, amounting to over twenty cases.

329 S. Twelfth St., Philadelphia.

CONTRIBUTIONS TO THE NORMAL AND PATHOLOGICAL HISTOLOGY OF THE FALLOPIAN TUBES.

By J. Whitridge Williams, M.D.,
Assistant in Gynecology, Johns Hopkins Hospital, Baltimore.

For convenience of description I will divide the tube into three portions (Henle[1]): The isthmus, or the straight, narrow portion extending directly outward from the uterus; the ampulla, or the enlarged curved lateral part of the tube; and the infundibulum, or the fimbriated end of the tube. The isthmus is usually about 2 to 3 mm. in diameter, and the ampulla 6 to 10 mm. or more.

Roughly speaking, the tube may be said to consist of three coats: the serous (or, more properly speaking, the subserous), the muscular, and the mucous coats. Of these, the muscular and mucous coats are by far the most important.

The Serous Coat.—As the tube lies within the folds of the broad ligament at its upper margin, it is consequently almost entirely covered by peritoneum, except below where the two layers of the broad ligament converge and the tissues of the tube and broad ligament become continuous. Beneath the peritoneal covering is a thicker or thinner layer of connective tissue, the subserous coat. This layer is most rich in bloodvessels, and in its inferior portion—that is, the part not covered by peritoneum—run most of the large vessels that supply the tube.

The Muscular Coat.—As the uterus and tubes were originally the same canal—Müller's ducts—and as in adult life they are continuous, it would appear only natural to suppose that their muscle layers would be continuous, and that the tube, like the uterus, would contain three distinct layers of non-striated muscle, as is really the case. This fact was known to Henle,[2] whose description of the tube is certainly far superior to any yet written; but it has apparently been lost sight of by all the later writers on the subject, such as Martin,[3] Orthmann and Coe,[4] for they mention only two coats. The greater part of the thickness of the tube is due to its muscular layer, which can only be studied properly in serial sections of the same tube, for the arrangement differs considerably in different tubes and even in different parts of the same tube.

The greater part of the muscular wall consists of a thick band of circular fibres which is usually quite distinct, except at the lateral end

[1] Henle: Handbuch der Anatomie, Bd. 2, p. 485. [2] Ibid.

[3] Martin, A.: Handbuch der Frauenkrankheiten, 2 Auf., p. 378.

[4] Coe, H. C.: "Anatomy of the Female Pelvic Organs," Mann's System of Gynecology, vol. i. p. 161.

of the tube, where it fuses with the other layers and forms an irregular meshwork of muscle fibres, with the fibres running in all directions.

Outside of this comes a thinner layer of longitudinal muscle, which is also very distinct; and upon this follows the subserous connective tissue.

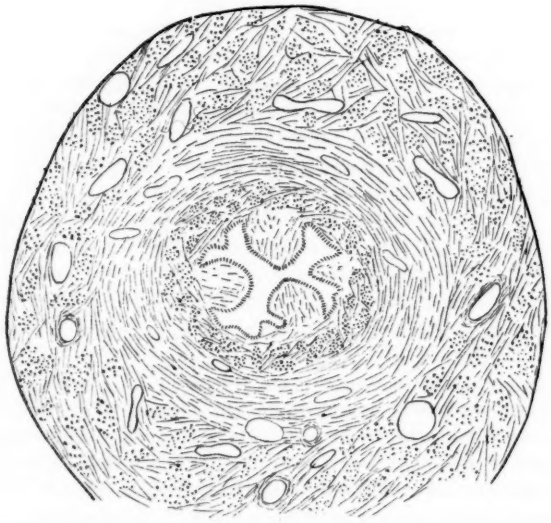
These are the two layers usually described by writers upon the subject, for they are readily seen on section from any part of the tube, except near the fimbriated extremity, where all the layers fuse together.

In some cases, however, the two layers become so blended throughout the entire length of the tube that it is impossible to separate them. (Fig. 4.)

These two layers correspond to the outer and middle coats of the uterus, and constitute almost the entire thickness of the wall of the tube.

Beside these two layers there is a third, corresponding to the third or inner muscular coat of the uterus. On cutting sections of the tube just at the cornu uteri (Fig. 1) one sees, just within the circular layer, a

FIG. 1.

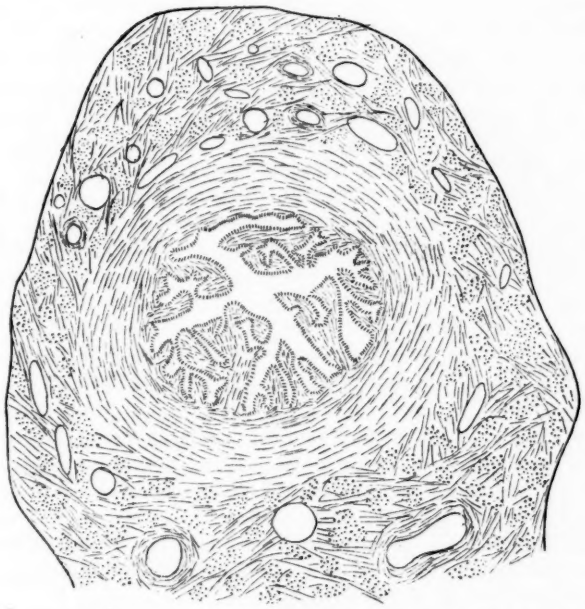


Cross-section of tube at cornu uteri, showing the four primary folds of the mucous membrane and the three layers of muscle forming the tube wall.

well-marked but thin layer of longitudinal muscular fibres. This can be traced as a distinct layer for some little distance, but it gradually becomes thinner and thinner, and, fusing with the circular coat, finally disappears.

Fig. 2 represents a section from the same tube about one inch nearer the fimbriated extremity than Fig. 1; and even at this distance from the uterus, the inner longitudinal layer has completely disappeared. It is apparently due to this fact that it is not mentioned by most writers, for sections from the middle portion of the tube show no trace of it.

FIG. 2.



Cross-section of the same tube at isthmus, one inch from Fig. 1, showing a more complicated arrangement of the mucous membrane and the disappearance of the inner longitudinal muscular layer.

THE MUCOUS MEMBRANE.—The most important and characteristic portion of the tube is the mucous membrane. Its arrangement is most remarkable, and in none of the English works is any adequate idea given of its complexity. The figure from Luschka,[1] which is usually given in the text-books, cannot pretend to represent a section from any part of the tube with any degree of accuracy.

It is only by the study of serial sections that the true arrangement of the mucous membrane can be appreciated, for in no other way can one

[1] Luschka: Anatomie.

follow the wonderful changes from the simple, irregular canal at the uterine end of the tube to the wonderfully complicated structure at the ampulla.

Like all mucous membranes, that of the tube has its epithelial lining, its membrana propria, and its connective-tissue framework into which muscle fibres frequently penetrate.

The mucous membrane is arranged in longitudinal folds, which vary in appearance according to the portion of the tube under examination.

Sections at the cornu uteri (Fig. 1) show a star-like lumen, which is formed by a few folds of the mucous membrane, usually four in number, though the number may vary from three to six. This is the arrangement of the entire tube at an early period of fœtal life, and is the permanent arrangement throughout life in the bat and monkey. We may designate these folds as primary folds.

A short distance from the cornu uteri, secondary folds develop from the sides of the primary folds and thus produce a more complicated picture, as shown in Fig. 2, a section through the isthmus, one inch from the cornu uteri. This represents the general arrangement throughout the isthmus.

From these secondary folds, other folds may develop until at last each primary fold presents the most complicated appearance, so that the lumen of the tube is almost entirely filled with dendritic processes, as shown in Fig. 3.

This formation of folds attains its greatest development in the thickest part of the ampulla, and becomes less marked as one approaches the fimbriated extremity, where the original folded condition becomes once more apparent on the surface of the fimbriæ.

If one only examined cross-sections of the tube, one could readily suppose that the mucous membrane was provided with villi with glands between them, similar to the follicles of Lieberkühn.

Longitudinal sections, however, show that these processes are not villi at all, but simply cross-sections of longitudinal folds, which increase in number as one approaches the fimbriated extremity.

These folds are composed mostly of connective tissue, though they may contain a considerable amount of muscular tissue. The larger folds contain bloodvessels of considerable size and frequently large empty spaces corresponding to lymph-vessels.

The entire lumen of the tube is covered by a single layer of high columnar ciliated epithelium, under which comes an imperfectly developed propria.

All the cells are ciliated, and cilia can be seen in motion several hours after death; they are frequently as long or longer than the cells themselves. My statement that the epithelium is disposed in a single layer

is supported by the statements of Henle,[1] Frommel,[2] and Orthmann.[3] On the other hand, Hennig[4] and others state that it is composed of several layers of cells; this statement was evidently made on the strength of observations made on sections which had been cut obliquely; for in that case one might readily suppose that the epithelium was composed of several layers.

FIG. 3.

Cross-section of the same tube through the thickest part of the ampulla, one inch from Fig. 2, showing the extremely complicated arrangement of the mucous membrane and the two layers of muscle composing the wall.

These three sections are from a tube which was obtained at the autopsy of a nineteen-year-old virgin dead of typhoid fever.

They are all drawn under the same power of a Winckel microscope with a Zeiss camera lucida, and so represent with tolerable accuracy the absolute increase in the size and complexity of arrangement of the tube from its uterine extremity to the ampulla.

The statements of Hennig,[5] Bland Sutton[6] and others that the tube contains glands is also based upon false observations, as was conclusively

[1] Handbuch der Anatomie.

[2] Frommel: "Beiträge zur Histologie des Eileiters," Verhandlungen der Deutsch. Gesellschaft f. Gynäkologie, 1886, p. 95.

[3] Orthmann: "Beiträge zur normalen Histologie und zur Pathologie der Tuben," Virchow's Archiv, Bd. cviii. p. 165.

[4] Hennig: Katarrh der weiblichen Genitalien.

[5] Hennig: "Ueber die Blindgänge der Eileiter," Arch. f. Gyn., Bd. xiii. p. 156.

[6] Sutton: "Glands of the Fallopian Tube and their Function," Trans. of the London Obstetrical Society, 1888, vol. ii.

shown by Frommel,[1] who, after tying both ends of the tube, injected it with Flemming's solution, and when it was hardened, cut sections. "The effect was that all the folds which were in contact were separated from each other, and the rounded lumen of the tube was lined by branching, tree-like processes, but no trace of glands could be found." The blood-supply of the tube is most abundant, especially on its lower margin, where bloodvessels, sometimes three to four mm. in diameter, are found.

An interesting condition which I have observed in the arteries of the tubes of multiparous women and which I have not observed in nulliparous women, is that they are often the seat of a marked endarteritis, similar to that found in the vessels of the uterus and attributed to a secondary growth of connective tissue, consequent upon the increase in size of the vessels produced by pregnancy—its object being to narrow the lumen according to the needs of the parts.

This is the only change that persists after pregnancy, for Thomson[2] has lately shown that the only change that takes place in the tubes of pregnant rabbits is an increase of the muscle cells to double their size, but that they return to their normal size within twelve days after labor, and show no trace of the past pregnancy.

The tube has three layers of muscle, corresponding to the three layers in the uterus, and not two, as usually stated.

Its mucous membrane is arranged in longitudinal folds, not villi.

Its epithelium is arranged in a single layer and contains no glands.

The arteries of parous women frequently show marked endarteritis.

DIVERTICULA OF THE TUBE.—In connection with the normal anatomy of the tube, I desire to call attention to an abnormality in its development which may bear a causal relation to the production of extra-uterine pregnancy. I refer to diverticula extending from the lumen into the wall of the tube, reaching almost to its peritoneal covering. They are lined by the typical single layer of ciliated epithelium, and correspond in all respects to the structure of the normal lumen of the tube.

They should not be confounded with the so-called accessory ostia of the tube; for, unlike them, they do not open on the outer surface of the tube, and, on simple inspection, give no evidence of their existence.

I have observed this anomaly on two occasions, one as follows:

The specimen was obtained from a laparotomy performed by Dr. Kelly for a papillomatous cyst of the left ovary and a small corpus

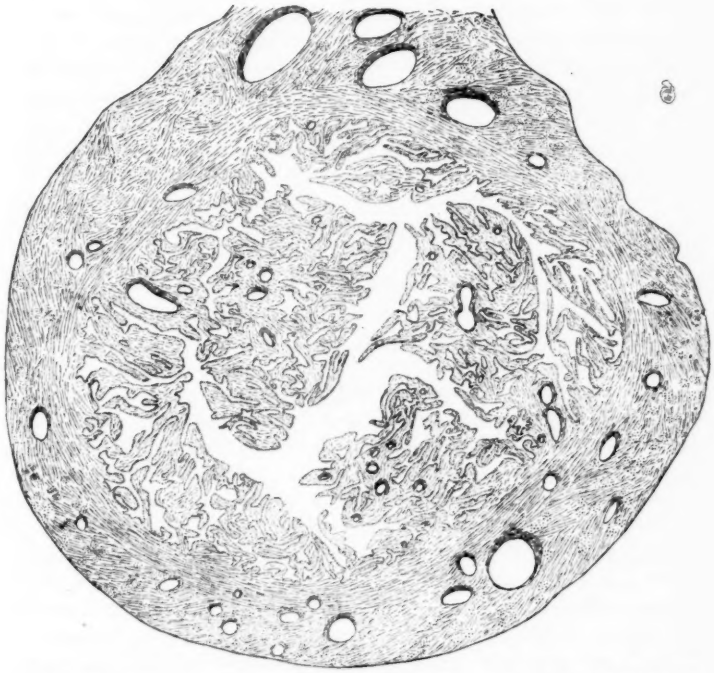
[1] Loc. cit.

[2] Thomson: "Ueber Veraenderungen der Tuben und Ovarien in der Schwangerschaft und im Puerperium," Zeitschrift f. Gyn., Bd. xviii. p. 273.

luteum cyst of the right ovary. Both Fallopian tubes appeared perfectly normal and it was only on cutting sections of the right tube that this condition was discovered.

The sections were made from the ampulla of the tube and presented the following appearance: The lumen of the tube presented the characteristic normal appearance, but was situated excentrically in the tube, the anterior wall being at least twice as thick as the posterior. The

FIG. 4.



A portion of a cross-section of the tube at the ampulla. It represents the thickened anterior wall, containing a cross-section of the diverticulum from the lumen. It also shows how the layers of muscle may become blended together.

normal arrangement of the muscular layers was not observed, the entire wall being composed of fibres interlacing in all directions; otherwise it presented nothing abnormal.

In the thickened anterior muscular wall, somewhat below the level of the lumen and near the peritoneal covering, a small duct about one mm. in diameter was observed, separated from the lumen by a mass of muscular tissue about two mm. thick.

This "duct" presented the characteristic appearance of the tube, and was lined by a single layer of ciliated columnar epithelium, as represented in Fig. 4.

On cutting serial sections, it was found to communicate with the lumen of the tube, and was consequently a diverticulum from it. The diverticulum at its point of departure from the lumen of the tube was about two mm. in diameter. In its further course it was surrounded by a narrow layer of circular fibres, outside of which came the interlacing network of muscular tissue.

A glance at Fig. 4 will show that the diverticulum ran obliquely through the thickened anterior muscular wall, and for a certain distance constituted a canal distinct from the lumen of the tube.

How often similar formations occur I am unable to state, for I have only found them twice, and the only reference to them in the literature was made last year by Landau and Rheinstein,[1] who found a similar case.

They bear some resemblance to the accessory tubal ostia of Richard,[2] Rokitansky[3] and Klob,[4] but do not open on the surface as they do.

They also bear a marked resemblance to the sieve-like epithelial structures found in the tube in tubal pregnancies, as described by Werth.[5] As the tubes in my cases were not pregnant, we in all probability do not have to deal with the same formation, for I regard the structures mentioned by Werth as secondary to the changes produced by the tubal pregnancy.

Whether they be connected with these formations or not, I consider that they may hold a causal relation to tubal pregnancy. For what could be simpler than for the fertilized ovum to be driven by the action of the cilia into such a cul-de-sac, and to remain there and develop.

Such an origin would also explain the early rupture in these cases; for the ovum would only be separated from the peritoneal cavity by a thin layer of muscle, instead of the whole thickness of the tube wall.

In this opinion I am supported by a case of Landau and Rheinstein's:[6] In a six weeks' tubal pregnancy, and in which the woman died from hemorrhage, on cutting sections of the pregnant tube they found the embryo in the upper part of the tube close under the peritoneum; while in the lower part of the tube, and separated from the ovum by a thick mass of muscular tissue, they found the almost unchanged lumen of the tube. From this observation they concluded that the pregnancy

[1] Landau und Rheinstein: "Beiträge zur path. Anatomie der Tuben," Arch f. Gyn., Bd. xxxix, p. 273.

[2] Richard: "Pavill. multipliés, etc.," Gaz. Méd. de Paris, 1851, No. 26.

[3] Rokitansky: "Ueber accessorische Tubarostien und ueber Tubaranhänge," Allg. Wiener med. Zeitung, 1859, No. 32.

[4] Klob: Die path. Anatomie der weiblichen Sexualorgane, Wien, 1864. "Accessorische Tubarostien," p. 279.

[5] Werth: Beiträge zur Anatomie der Extra-uterinschwangerschaft, 1887.

[6] Loc. cit.

developed in a diverticulum from the lumen, similar to the one just described.

The proof is not absolute, but the facts are extremely suggestive.

Twistings of the Fallopian Tube.—I also desire to direct attention to a twisted condition of the tube, and will attempt to show that it may help to explain some conditions which were previously inexplicable.

Freund,[1] of Strasburg, and one of his pupils, Schober,[2] were the first to direct our attention to the significance of this condition, and my observations tend to substantiate their statements.

A peculiar and inexplicable fact in the development of the Fallopian tubes is that at an early period they undergo a process of twisting which begins at the uterine end of the tube and extends outward until at last the entire tube presents a corkscrew-like appearance.

What causes this twisting is absolutely unknown, unless we suppose it to be due to the resistance offered to its growth by the surrounding parts, as in the case of the sweat-glands.

In a fœtus of five months this process is quite marked (Fig. 5, *A*), and it gradually increases until the eighth month, when it has reached its highest development.

At this period it presents a corkscrew-like appearance with from six and a half to seven and a half twists, beginning at the uterine end. (Fig. 5, *B*.)

This condition I have noticed in several cases.

In the period between birth and puberty the tube is gradually untwisted, beginning at the uterine end and extending outward, until at puberty the twists have entirely disappeared or are only represented by a mild curve in the course of the tube.

This process is represented in Fig. 5, *C*, from a three-year-old child, and Fig. 5, *D*, which represents the normal tube at the time of puberty.

What significance this process may have in the development of the tube I am unable to state; though even during childhood it may become so marked as to cause the tube to be twisted apart, as has been observed by Rokitansky.

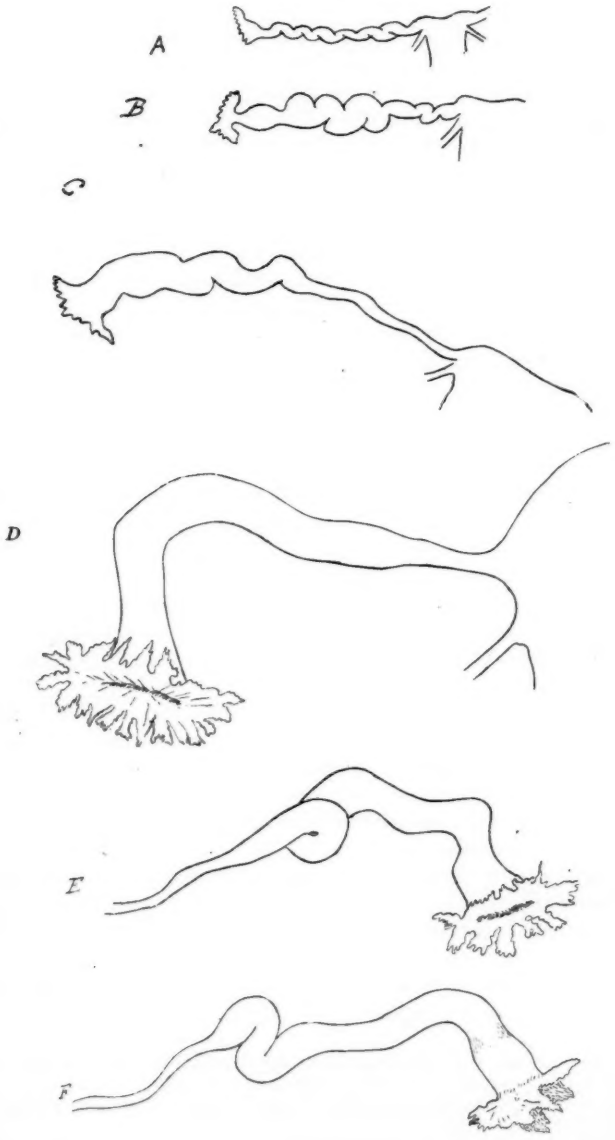
Owing to lack of development or some unknown cause, the twisted condition of the tube may persist throughout life. Most of the cases in which this has been noticed are in women who are poorly developed sexually.

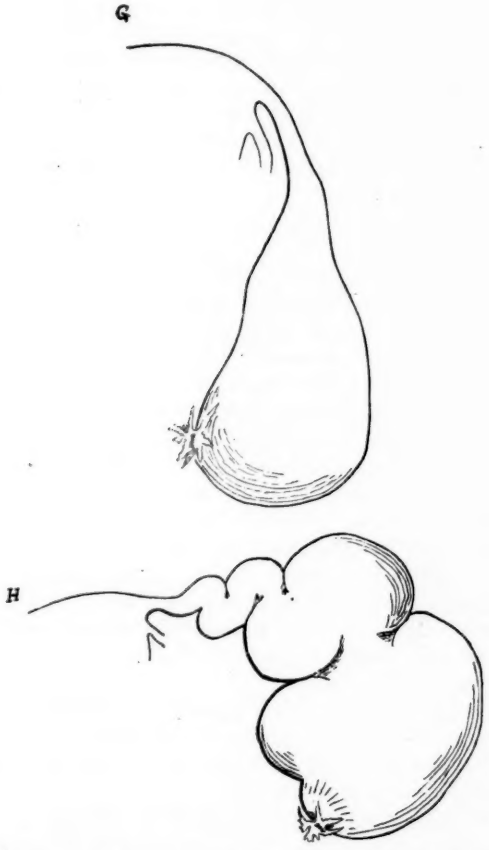
It will be readily understood that such a condition in an adult woman may lead to serious consequences.

[1] Freund: "Ueber die Indicationen zur operativen Behandlung der erkranken Tuben," Volkmann's Sammlung klinischer Vorträge, 1888, No. 323.

[2] Paul Schober: "Ueber Erkrankungen gewundener Tuben." Inaug. Dissert., Strasburg, 1889.

FIG. 5.





A represents the tube of a five-months' fœtus, with the twisting well marked. *B*, the tube of an eight-months' fœtus with the twisted condition at its highest development. *C*, the tube of a three-year-old child, showing the gradual obliteration of the twists. *D*, the tube of a well-developed girl at puberty. *E* and *F*, the tubes of a sterile married woman, aged thirty-nine years, who was otherwise perfectly healthy. *G* represents a hydrosalpinx developed in a normally arranged tube, and *H* a hydrosalpinx developed in a twisted tube.

In the first place, one or more of the twists may be so marked as to cause a total occlusion of the lumen, just as one may do with a rubber tube. The consequence of such an occlusion would be that the woman would be sterile, for the ova could not pass beyond it on their passage to the uterus, nor the spermatozoa above it on their way to the ovary; and

if the condition were the same on both sides, the woman would be perfectly sterile. Fig. 5, *E* and *F*, represent both tubes from a sterile woman aged thirty-nine years, who was otherwise perfectly healthy.

A similar condition of the tube may cause retention of the normal secretions and so give rise to a hydrosalpinx, which may be lobulated or not, according to the number of twists by which the lumen is occluded. Fig. 5, *G*, represents a hydrosalpinx in a normal non-twisted tube, and Fig. 5, *H*, in a twisted tube.

I desire to record the following case of hydrosalpinx, which I believe was caused in this way. I will quote from my records—"January 26, 1891: Tube and ovary from left side. Tube converted into a lobulated hydrosalpinx, immensely distended, and wound around the ovary; 19 cm. long, 6 cm. in widest and ½ cm. in thinnest part. For a distance of 7 cm. from uterus the tube is apparently unchanged and about 5 mm. in diameter, then it suddenly expands into the lobulated hydrosalpinx, which was densely adherent to the ovary. The median end of the tube is perfectly pervious, but it is impossible to pass a fine probe from it into the hydrosalpinx, for it appears to pass into a cul-de-sac and go no further. On cutting open the dilated end of the tube and probing toward the uterus, on giving a slight twist the probe readily passed into the undilated part, thereby giving the impression that the constriction was caused by a twist in the tube."

This certainly appears to be a rational explanation for some cases of hydrosalpinx. In other cases the twisting may not totally occlude the tube, but only cause a narrowing of its lumen, and this also may lead to serious consequences.

If, for example, the tube becomes inflamed, the swelling of the mucous membrane may be sufficient to cause total occlusion or to so narrow the lumen that the secretions collect and greatly interfere with healing by preventing drainage of the parts.

If we have a purulent salpingitis, nothing is simpler than for the apposed surfaces of the twisted portion, which have lost their epithelium, to become adherent and thus produce a total and permanent occlusion and rapidly form a pus cavity. And according as one or more twists become imperforate, we get a more or less lobulated mass.

These twistings, of course, cannot be diagnosed during life, except in cases in which they lead to the formation of lobulated tumors, when the lobulated form will distinguish them from the more rounded or pear-shaped tumors, which develop from the normally shaped tube.

This abnormality, however, deserves consideration, for it may explain many cases of sterility, some cases of obstinate catarrhal salpingitis, and many cases of hydro- and pyosalpinx.

REVIEWS.

A PRACTICAL TREATISE ON DISEASES OF THE SKIN. By HENRY G. PIFFARD, A.M., M.D., Clinical Professor of Dermatology, University of the City of New York; Surgeon-in-charge of the New York Dispensary for Diseases of the Skin, etc.; assisted by ROBERT M. FULLER, M.D. With fifty full-page original plates and thirty-three illustrations in the text. New York: D. Appleton & Co., 1891.

THIS is an *édition de luxe* of a work covering not the whole but a large and essential part of the great field of cutaneous medicine, with numerous illustrations of disease, chiefly reproductions of photographs taken by the author, many of which are so good as to constitute the chief element of value in the book. The whole is a striking evidence of the courage and ability of the author.

Only a fearless contributor to science would venture upon questions in the discussion of which the schoolmen have produced ponderous tomes, and dismiss the same in as many pages. For example, in touching the enormous group of the syphilodermata, to whose peculiar symptoms such writers as Duhring, Crocker, and Keyes have devoted from two to three score of folios, and the mere references for which, in the treatises of such authors as Jullien and Fournier, would alone furnish a good-sized volume, Dr. Piffard contents himself with ten pages merely of the work before us and the ten portraits which serve to explain the text. Let not the reader of these lines think that in commenting thus upon the fruit of our author's labor the contrast suggested is designed to convey a sarcastic reproach. Far from it. There is no more constant mark of the man of genius than his power to compass this particular end. Where others toil with infinite pains over the obstacles in a tortuous road, the mind of the explorer traverses the direct and smoother path which he soon pursues as a pioneer. Louis XIV. could express the whole of his autocracy in an epigram. Haden has portrayed a landscape with a few touches of his burin. Certainly no observant physician can study these pictures of disease without gaining some insight into the problems which other writers have required so much space even to adequately propose to the understanding. The best of the illustrations are: Fig. 1 (erythematous eczema of the hand), Plate II. (symmetrical eczema of the knees), Plate IV. (psoriasis of the sole), Plate XIV. (dactylitis syphilitica), Plate XXV. (elephantiasis), Plate XXVI. ("seborrhœa kerativa"), Fig. 19 (an admirable portrait of the pediculus pubis, the best thus far exhibited by any contributor to the subject), Plate XLVIII. (ichthyosis), and Plate L. ("psorospermosis"). The portraits of psoriasis of the general surface of the body are some of them good, but not superior to those which have been before

published. The hand represented on the upper portion of Plate III., described as the seat of an eczema, looks suspiciously like those displaying a palmar syphiloderm, an appearance which would doubtless be dispelled if the original colors of the exanthem could have been reproduced. Indeed, allowance must be made in studying all of these interesting plates and figures for the absence of color-effects, upon which the diagnostician relies, in part at least, for his conclusions. But it is excellent practice to dispense at times even with the aid of vision in making some investigations of disease.

Perhaps the gravest charge that can be brought against our author in the production of this really creditable work is one which he must bear with many of his clan—that of burdening dermatology with new names. There was a day of joy in medicine when the senior Hebra with unsparing hand swept into the street the dust of dermatology, the rubbish of its meaningless names which had accumulated during the centuries. For a brief time thereafter it was a reproach to give a new title to a disease of the skin, a name likely to share the fate of "rupia," "lichen eczematodes," "porrigo larvalis," and the like. But as time passed the temptation grew great, opportunities multiplied, and men "rose up which knew not Joseph." The greatest sinner on this score is one of the most prolific contributors to cutaneous medicine, and not a few of his peers in the late Congress at Paris besprinkled their discussion of diseases of the skin by distinguishing that upon which they engrafted their own names from another to which they did not refuse to give the name of a colleague. Even the newborn "eczema seborrhoicum" of Unna, Dr. Piffard designates as "sudolorrhœa," a faulty term if employed to suggest the characteristic picture of the process, though our author accurately describes the malady in the text of his work. "Seborrhœa kerativa" and "mammillitis maligna" are novelties in name if not as to the process they represent. No reader of these pages familiar with the text-books on diseases of the skin written by the first ten authors in dermatology of America and Great Britain, would recognize, without some study, the classical and well-named tinea versicolor in "chromophytosis." There is no law binding upon any writer to observe strictly the nomenclature of the American Dermatological Association. That nomenclature is unquestionably defective and can doubtless be revised with enormous advantage. But with all its defects it has in this country done more in the direction of systematizing a knowledge of diseases of the skin than an entire edition of the most valuable treatise on the subject that has yet appeared. It would have been a gracious and valuable concession if the man who once filled the honored position of president of that Association had at least given the American titles of diseases of the skin in brackets after those of his own preference. The reason he has not done this has already been shown. In all seriousness, it is admitted that his is the mind of a genius impatient of barriers and disdainful of routine.

But let not the soul of the average professional man searching for the truth in cutaneous disease despair of finding his facts beneath this enormous and accumulating rubbish of names, many of them with the cards of their proprietors affixed to each. There is no evil under the sun but carries within it the germ whose development is its doom. When the burden becomes at last too heavy, and the shoulders beneath sufficiently impatient, the hour strikes for rebellion, and lo! the reformer is at hand

for the relief of the victim of oppression. He that will do this great thing for dermatology is probably living to-day. He will almost surely be an American, but he will know all that is worth knowing of the lore of the schoolmen and of the dicta of the masters. He will have scanned all the fields that have been opened to the eye by the microscope, but he will be broader than a bacterium and not mensurable with a micrometer. And he, too, shall sweep into oblivion heaps upon heaps of idle names whose chief value is to furnish the landmarks dear to the historian, showing how laboriously and by how many devious roads man climbs to the light. He will, however, do more than this. He will show that it is indeed quite rare for a man to suffer from a disease of the skin whose morbid products intoxicate his liver, his spleen, or his kidney, and that it is quite as rare for any one of these organs to generate a poison that induces a disease of the skin.

The chapter of special interest in this volume, one in fact of such importance in the mind of the author, that he specially refers to it in his preface, is that which concludes the list, touching upon psorospermosis. The opinions here stated are those already published over Dr. Piffard's signature in the *Journal of Cutaneous and Venereal Diseases*, issue with which was speedily taken by Dr. Lustgarten in the same periodical. The facts are nearly these:

In the year 1889 Darier and Wickham exhibited to the members of the Congress of Dermatology and Syphilography in Paris, a patient displaying the symptoms of a disease termed by them "psorospermose folliculaire végétante," illustrating the results of invasion of the skin by psorosperms or coccidiæ (also termed pseudo-naviculæ), parasites classed by some zoölogists among the protozoa; and considered by others as algæ. They are not rarely found parasitic in the viscera of the vertebrata, particularly in the livers of ill-fed rabbits.

Soon after appeared Wickham's monograph,[1] practically exhausting the subject to that date, claiming not only for the disease exhibited in the Paris patient, but also for Paget's disease of the nipple, molluscum sebaceum, and possibly other maladies, an origin due to parasitic invasion by psorosperms. Dr. White, of Boston, had already described one patient in this country (another since that date) exhibiting all the symptoms of the so-called psorospermosis of Darier and Wickham. The bodies figured by Wickham in his work are those recognized in London by Delépine, Bowlby, and Hutchinson, Jr., who failed to get definite reactions by which to identify the coccidiæ and to distinguish them clearly from altered epithelial cells. The parasites appear as oval, roundish, or spindle-shaped bodies which later elongate and become in turn pyriform or fusiform, eventually showing long, coiled, sickle-shaped filaments within a capsule not unlike spermatozoa.

Dr. Piffard, after employing polarized light by transmission through sections of tissue containing the so-called psorosperms, concludes that they are rete cells undergoing a species of corneous degeneration; and it must be confessed that the evidence in favor of this view is slowly accumulating. Thin, of London, under date of May 16, 1891, reports that in cases of Paget's disease he had found an "immense number" of these bodies, "psorosperms," and believes that "they were nothing else

[1] Contribution a l'étude des Psorospermoses Cutanées et de certaines formes de Cancer; Maladie de la peau dite "Ma'adie de Paget," par le Dr. Louis Wickham. Paris, 1890.

than epithelial cells in various stages of transformation." Lastly, Messrs. Shattock and Ballance, of London, taking psorospermial material from the livers of rabbits, have inoculated therewith other rabbits, monkeys, dogs, and rats with negative results, the injections into the jugular vein, "vaccination" experiments, etc., producing merely hyperplastic products at the site of injury. These authors claim that Darier's views must be tested according to Koch's postulates, experimental infection of a human being or lower animal being produced by fluids obtained from culture of the products of a carcinomatous lesion, or from the "psorospermose folliculaire végétante" of the French writers.

Dr. Piffard's style is clear and attractive; at times the philosophical amplitude of even his shortest sentences is highly suggestive. He has made here a valuable contribution to the clinical resources of the student of dermatology, and deserves great credit for the manner in which he has produced both text and portraits. There are a few errors in the book, the most conspicuous of which occurs in describing "chromophytosis" as due to the "microsporon Audouini" (p. 113), as this fungus was first named by Eichstedt, of Greifswald, in 1846, as the microsporon furfur. The microsporon Audouini was named by Gruby after Audouin, and was the fungus supposed to be effective in the production of alopecia areata; but it has since shared the fate of the impostor who claimed to have first discovered the parasite productive of scabies, and whose name survives only among the French, by whom that disease is still called "Gale."

J. N. H.

DIABETES: ITS CAUSES, SYMPTOMS AND TREATMENT. By CHARLES W. PURDY, M.D. With Clinical Illustrations. Pp. viii., 184. Philadelphia and London: F. A. Davis, 1890.

DR. PURDY'S little volume is a meritorious effort to set forth the present status of our knowledge on the subject of diabetes, "in such practical and concise form as shall best meet the daily requirements of practice," and is based upon "a careful study and recorded observation of the disease, extending over a period of twenty-one years." He has "endeavored to bring out prominently the leading features of diabetes as it occurs in the United States, together with the natural resources of the country best suited to the disease, as the waters, foods, and climate, since the very extensive range of these entitles them to rank in point of efficiency for the relief of the diabetic patient as at least equal to those in any other land or clime."

The first section is devoted to Historical, Geographical, and Climatological Considerations of Diabetes Mellitus from the data afforded by mortality statistics of the census of 1880, not including States and Territories furnishing a total death-list of less than 5000. The author has compiled a number of tables illustrative of the comparative mortality from diabetes in different portions of the United States and the relations of the mortality to temperature, rainfall, elevation, population and urban and rural residence. By these tables he apparently demonstrates that, in the United States at least, cold and altitude are the chief climatic features which determine high mortality from diabetes. Thus, for instance, in the State of Vermont we have 6.36 per thousand deaths

attributed to this disease; according to the author, the highest ratio of any place in the world. Vermont is noted for its long continued and severe winters. Maine, the climate of which is very nearly the same as Vermont, gives the next highest mortality in diabetes in the United States, 4.41 per thousand. The difference between Maine and Vermont is attributed to the greater altitude of the latter. A striking contrast is afforded by Alabama, where the mean annual temperature is about 75° F., and the elevation above the sea in considerable. The mortality from diabetes sinks to the lowest ratio in the country, 0.55 per 1000 deaths.

With Dickinson, and against Sir William Roberts, Purdy finds a mortality from diabetes among the rural population greater than among the dwellers in cities. In the North Atlantic coast region the mortality among the rural population is 3.55 per 1000 deaths, and among urban dwellers 1.76. In the Gulf coast region, on the contrary, the rural mortality is 0.49, the urban 1.56. The author advances the following explanation of these facts:

"Cold greatly increases the mortality from diabetes. In cold climates those who are best sheltered from climate suffer least from disease. This fact is brought out in strong contrast in the United States, because there the houses are constructed with a view to greater warmth and comfort than in Europe. In the warm climates of the South the evil effects of cold no longer appear, and the atmospheric conditions affecting the disease are chiefly those of purity. The country people are able to live in the open air the year round without exposure to cold or chill, and oxidation obtains its greatest activity. In the cities more or less confinement and impurity of atmosphere is inevitable, which tends to impede oxidation and give greater impetus to the disease."

The mortality reports of the United States census for 1880 record no death from diabetes among either the Indian or the Chinese population of the country. The Indians are spare eaters and subsist almost exclusively on nitrogenous foods, leading at the same time an active out-of-door life. The exemption from the disease enjoyed by the Chinese bears out the record from their native land, and appears to be due to a race peculiarity. One of the most important features, and the most deplorable one of the careful statistical investigations of the author, is that the relative mortality from diabetes in this country has been very decidedly on the increase during the last forty years. In 1850 it was 0.72 per 1000 deaths, and in 1880 it was 1.91 per 1000 deaths. The most marked increase was between 1860 and 1870—nearly 100 per cent.; from 0.98 to 1.70. The author rationally attributes this to the decided change in the habits of the nation consequent upon the Civil War. Previous to 1860 we were "a frugal and economical people, enjoying but moderate luxuries in living." The inflation of the currency; speculation; political and social demoralization, with its concomitants of luxurious living and extravagance; excessive labor and widespread dissipation, have inevitably increased the morbidity and the mortality of neuroses in general and diabetes among the number.

The sections devoted to Physiological and Pathological Considerations, to Etiology, Morbid Anatomy and Symptomatology, are clear, sufficiently full for the purpose of the work, and on the whole, reliable.

Treatment is considered under three divisions: Dietetic, Medicinal

and Hygienic. After varied and laborious experiments with substitutes for bread the author found the following method most satisfactory. The patient is permitted to use his own regular table bread, but the allowance is limited to half the usual amount. If sugar still appears in the urine the bread is further reduced by one-half, and if the sugar still persists bread is prohibited absolutely. According to the author's experience, if the patient cannot assimilate two to three ounces of bread daily without excreting sugar in the urine he cannot assimilate any substitute therefor, and under such circumstances the sooner all bread is stricken from the diet list the better. The author has never seen good results from an exclusive milk diet, and seems rather inclined to limit the amount of milk allowed to the patient. He gives a useful list of wines which may be permitted and those which should be prohibited, on the basis of analysis for sugar. All mineral waters are permissible as beverages and some of the alkaline waters he considers as curative. Among medicinal agents he discusses opium, antipyrine, the bromides, ergot, arsenic, iodoform, jambul, oxygen, and the alkalies. He finds limited use for opium, codeine being preferable in cases showing a continued high percentage of sugar in the urine despite the institution of strict dietetic measures; but he believes that sooner or later the drug has to be abandoned on account of its damaging effects on nutrition. Antipyrine is unsuitable for lengthy periods of administration in doses of forty-five grains a day, and in smaller doses is not claimed to modify the disease. Moreover, it is likely to cause albuminuria, and therefore cannot be considered a safe agent for use in these cases. Ergot has a useful influence over mild cases in which the patient retains good digestive powers. He has seen little benefit from either Giliford's or Clemens' solution of arsenic bromide, even when combined with Martineau's lithium treatment. The chief benefits he has obtained from arsenical preparations in diabetes have been from arsenite of iron in cases complicated with anæmia or malaria. Iodoform, if used carefully in doses of from one to three grains repeated three times a day or in sufficient doses at bedtime, continued for two weeks and resumed after an interruption of two weeks, seems to cause a diminution of thirst, of polyuria and of the amount of sugar excreted. The use of oxygen by inhalation is highly lauded, from three to five gallons of a freshly made gas being administered twice daily. Hydrogen dioxide water (one to two drachms, largely diluted with water) may be used, but is less efficacious. The alkalies are believed to increase the oxygen-holding powers of the blood. Stress is laid upon the avoidance of constipation, of mental emotion and of fatigue, as these are likely to lead to the production of coma. In addition to avoidance of fatigue, the points to be attended to in the hygienic treatment are proper aëration, proper clothing, and proper temperature. Besides hygienic clothing, in order to preserve the warmth of the body, warm baths followed by thorough rubbing of the skin are recommended. A moderate degree of exercise in the open air is necessary, and habits of regularity must be observed in eating, drinking and sleeping. A number of illustrative cases are recounted. A section is devoted to diabetes insipidus. A short but well-selected bibliography is appended. S. S. C.

TEXT-BOOK OF OPHTHALMOSCOPY. By EDWARD G. LORING, M.D. Edited by FRANCIS B. LORING, M.D. Part II. Diseases of the Retina, Optic Nerve, and Choroid: Their Varieties and Complications. New York: D. Appleton & Co., 1891.

THE reviewer's task is an agreeable one when he can praise without qualification; when the material presented to his critical analysis is of such real value as to justify him in commending the work to fellow-students; and when he feels that the knowledge gained from it better equips him for his daily work.

Dr. Loring's work is original and practical; it is a record of thorough and painstaking care in the observation of abundant clinical material. Not satisfied with the description of the coarse lesions so often exclusively given in text-books, his investigations have included subjects slighted or altogether neglected by other writers, subjects which to careful practitioners are matters of the highest importance. His studies, for example, of the minute changes in the light-reflex, color, pulsation, etc., of the retinal vessels taught him, and through his book teaches us, the grave systemic disturbances of which they are the forerunners. By diligent care in the use of the mirror, changes of diagnostic and prognostic significance are detected which escape the superficial and routine observer. Thus the field of ophthalmology is broadened by Dr. Loring's work. He teaches us how to diagnose by the mirror heart and blood irregularities, valvular disease, splenic, kidney, cerebral, and spinal affections in their incipiency, and proves the ophthalmoscope to be indispensable to the physician. The ophthalmic surgeon who absorbs the knowledge contained in this book is something more than an "eye doctor"—recognizing, as he must, that the eye is a connected part of the whole organism, he becomes an expert in the observation and interpretation of its signs. The fine distinctions between the healthy and unhealthy appearances of the eye-ground are especially noticed and emphasized, and it is in this particular that the eminently original studies of Dr. Loring are of great value.

The book contains 253 pp., divided into seven chapters. The first considers the vascular disturbances in the retina, such as changes in the length, breadth, and walls of the arteries and veins; vessels of new formation, aneurism, embolus, thrombus, stasis, hemorrhage, and anæmia, and of their causative relation to general disease. Chapter II. deals with an intermediate stage between purely vascular changes and those associated with signs of inflammation, designated by Jaeger as "irritation" of the retina. The importance of this chapter is well expressed in its opening paragraph. "This form of congestion, although chiefly distinguished from hyperæmia by the presence of functional disturbances, has yet some physical characteristics and features of its own which it is important to notice, especially in these days when all symptoms of asthenopia are referred to an error of refraction, should any chance to exist, even of an infinitesimal degree." Chapter III. treats generally of the characteristics of retinal inflammation, while Chapter IV. classifies and describes minutely the specific forms of inflammation. Particularly clear and instructive are the sections devoted to a description of albuminuric retinitis, retinitis pigmentosa, and detached retina. A classical account of diseases of the optic nerve, which leaves nothing unsaid, is

given in Chapters V. and VI. Chapter VII. concludes the book with original observations in diseases of the choroid. It will be noticed that the author has not adhered to that generally accepted classification of retinal and choroidal diseases which would seem to have been based largely upon the changes in the pigment coat. He has noticed alterations in the pigment in both retinal and choroidal disease, as they seemed to him dependent upon coexisting inflammation of one or the other membrane, and has described specific changes—hypertrophy and atrophy—of the pigment layer in separate sections.

The illustrations are numerous and well executed. Many are after Dr. Loring's own sketches and others are reproductions from Jaeger and Liebreich. In addition to the black-and-white prints in the body of the book there are at the end six plates, each containing two chromolithographs. The fault common to most attempts to portray diseases of the fundus—exaggeration of the abnormal conditions showing too great a contrast between healthy and unhealthy structures—is found in many of these illustrations.

The editor has done well to limit his duties chiefly to the arrangement and classification of the material of the author, and as he says in the preface, "I found there was so much original matter in it, so much that from its very nature must provoke discussion and argument, that I determined to publish it as it stood, without addition or correction." The wording throughout clearly conveys the author's meaning, and the ideas are purposely clothed in a conversational rather than a polished literary garb. Indeed, in his effort to be concise, the author has in a few instances fallen into the error of colloquial expression. Thus on p. 105 he uses the following language: "Not a single case of the slightest retinitis or neuro-retinitis can I find in all the literature of these cases, *let alone* a choked disc."

The type is of good size, the paper white and thick, typographical errors are few; in short, the book is in all respects admirably printed.

The reviewer earnestly commends the work to students of ophthalmoscopy as the best treatise in the English language on the subject.

H. F. H.

HYPNOTISME ET CROYANCES ANCIENNES. Par le DR. L. R. REGNIER, Lauréat de l'Académie de Médecine, etc. Avec 46 figures et 4 planches. Paris, 1891.

HYPNOTISM AND ANCIENT BELIEFS. By DR. L R. REGNIER, Laureate of the Academy of Medicine.

THIS book has a distinct and special value. It differs from the common run of works on hypnotism, and has a literary merit which few of them possess. This is partly because it leaves the beaten track. It does not deal altogether with the modern "craze" called hypnotism, but pursues its subject in the distant past. It introduces us to the mysteries of the Rig-Veda of the Hindoos and of the Zend-Avesta of the ancient Persians. It culls little items of interest from a papyrus found under the ruins of Thebes and from the cuneiform inscriptions of the ancient

Turanians. The Hebrew, Greek and Latin literatures are searched to prove the wonderful sameness of human weakness and gullibility through all the ages. Truly a wonderful book—fascinating and instructive. "One touch of nature makes the whole world kin." Dr. Regnier has given this touch, with grace and learning, to a subject which was quite worn out until reanimated by the magnetism of his pen.

The book is evidently inspired, however, by a preconceived idea. The author is an advocate and uses his stores of learning sometimes in the manner of a special pleader. For him hypnotism did not exist in the past. It is a modern product, almost as much as the steam-engine or the telegraph. He finds little, if any, evidence of hypnotism in the religious ecstacy of the ancient fakirs, the impostures of the magi, the serpent-worship of the Egyptians and the hysterical contortions of the Grecian pythoness on her tripod. To establish his thesis he gives minute and interesting details of the various usages and rites of these different mystic sects, and accompanies his narrative with penetrating and instructive criticism. He is more bent, however, upon making distinctions than upon finding analogies. It is here, perhaps, that the philosophic student of hypnotism will take issue with him. He defines hypnotism as a special state of the nervous system, artificially produced, the characteristic of which is a complete or partial unconsciousness, with total forgetfulness of all that transpires during its continuance. This artificial sleep was not known until after Puysegur, and was first described by the Englishman, Braid.

It is not for us to combat here the author's views. Far from it, we agree with him that hypnotism is quite a modern cult, and nowhere so much at home as in his own France. There the practice has been made perfect; the ritual is complete. We nevertheless think, in the author's own concise words: "L'humanité, depuis que nous la connaissons par l'histoire, n'a guère changé." Man has not changed—and the essential facts of hypnotism were in him at the beginning. Only this has happened—a new method is in vogue: the fakir and the pythoness have given place to the trained *comédienne* of the modern hypnotic séance. The induced sleep is no sleep at all, but only the inhibition of a weaker brain by the suggestion of a stronger one, and the adjuncts of time and place. This *suggestion* is the vital fact in hypnotism, and not, as Dr. Regnier would have us believe, the artificial sleep. From our point of view we can see very many striking analogies between the modern practice and the mystic rites which the author describes. From the time when Moses elevated on a pole the brazen serpent in the wilderness; or when the ancient Egyptians cast a spell over the faithful with the cabalistic triangles; or when the Hindoo seer went into an ecstasy with gazing on his own navel, down to the recent day when an aged priest in Pennsylvania cured by faith the credulous and devout—humanity has changed but little.

Hence Dr. Regnier's book may raise an issue in the minds of some students; who will not fail, however, to accord to it the high praise which its historic value and literary excellence abundantly deserve. The book contains many illustrations, some of them quaint, and many of them unknown to us before. It has also a very long and useful list of references.

J. H. L.

ŒUVRES COMPLÈTES DE J. M. CHARCOT. HÉMORRHAGIE ET RAMALLISSEMENT DU CERVEAU, MÉTALLOTHÉRAPIE ET HYPNOTISME, ELECTROTHÉRAPIE. Tome IX. Paris, 1890.

COMPLETE WORKS OF J. M. CHARCOT. CEREBRAL HEMORRHAGE AND SOFTENING, METALLOTHERAPY AND HYPNOTISM, ELECTROTHERAPY.

As we are told in the preface by the editor, Bourneville, this volume comprises three parts of unequal importance. The first is devoted to diseases of the brain, especially to cerebral hemorrhage, and some of its complications, immediate and remote. In the second part have been collected the numerous papers of Charcot on metalloscopy, metallotherapy and hypnotism. Scattered everywhere in the medical journals or in the transactions of the learned societies, it was very difficult for physicians to have recourse to the original publications, or to gain an exact idea of the work of the chief of the school of the Salpêtrière on these subjects.

It is further pointed out with what circumspection Charcot undertook the study of hypnotism—neglected, discredited for many years, and regarded as difficult by the best minds. On this point, as on all others, the learning of Charcot rests on a most solid basis, on facts submitted to the severest tests, especially as the most pronounced scepticism prevailed at the time. His facts are to-day definitely accepted by the great majority of physicians who are seriously occupied with this department of neurology.

In the third part is reproduced a lecture by Charcot on static electricity, and which to some extent is related to the other subjects.

Among the more important papers in the first part is the admirable research of Charcot on the Pathogenesis of Cerebral Hemorrhage, published originally in 1868; on Hemorrhage into the Posterior Third of the Internal Capsule, published in 1875; on Neo-membranes of the Dura Mater, 1860; and on Arthropathies depending on Lesions of the Brain and of the Cord, 1868. The last mentioned is especially interesting.

In the second part the more important are, Hints and Observations on Metalloscopy and Metallotherapy, embracing among other things a consideration of the action of magnets, and published in 1877; and another on the same subject, in which the phenomena of transfer are considered; others on Catalepsy and Somnambulism follow. The most interesting of all, however, are his studies on Hypnotism among Hysterical Subjects, published in 1881, and on which subject one of his pupils, Paul Richer, afterward published a volume. Surely the collection of papers before us shows how much we owe the knowledge we possess of these obscure subjects to Charcot and his school.

Thus far nine volumes of Charcot's works have been published, and a tenth is to follow. All of them relate to neurological subjects except three—the fifth, sixth and seventh—which respectively embrace Charcot's productions in the field of diseases of the lungs and vascular apparatus, diseases of the liver and kidneys, and diseases of the aged, gout and rheumatism. They form an imposing monument of the life-work of this industrious man, and in their present shape the papers, properly collected and arranged, form an indispensable source of reference.

F. X. D.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

On the Preparation and Use of Ointments in Diseases of the Skin.

Dr. L. Duncan Bulkley has published a practical and suggestive article on the above subject and gives many hints of value to practitioners. The application of ointments constitutes such a large element in the treatment of diseases of the skin, by the profession at large, that it seems desirable to present a few words of caution concerning their preparation and employment, for want of success often results from the improper compounding or application of one or another of this class of remedies.

It is better not to trust to any artificial means for preserving the freshness of ointments, but to secure sweet and good material and always to reject that which is at all old, or ointments which have been long prepared. It is important to avoid the slightest rancidity in ointments, and it is better to order ointments to be freshly compounded of the strength desired, rather than to take those officinally prepared and kept in stock.

Among cerates, which are in some respects more valuable for ointments for most skin affections than lard, we have two, *ceratum simplex*, consisting of white wax 30 parts, lard 70 parts; *ceratum cetacei*, which is composed of spermaceti 10 parts, white wax 35 parts, and olive oil 55 parts. To these should be added *unguentum cetacei*, which is very like the latter, only somewhat softer. These all have considerable body, and when spread on the skin form a protective coating, more suitable for many conditions than lard alone; but the first mentioned, or simple cerate, is far too hard for easy application in most diseases of the skin. The *glyceritum amyli*, composed of starch 10 parts and glycerin 90 parts, is a good basis for ointments when fatty sub-

stances are not well borne, or when it is desirable to remove the application frequently with water. Combined with oil of cade 25 parts, sapo viridis 15 parts, and glycerite of starch 60 parts, it makes a most valuable application in psoriasis, which can be well rubbed in at night and washed off completely in the morning.

The *oleum theobromæ* is ordinarily but little used in compounding ointments. It is particularly useful when added, in about a quarter part, to ointments for use on the hairy scalp, to give them a low melting-point and to aid in forming a protective coating over the skin; when employed in too large a proportion it will prove irritating to many skins.

Under the head of "ointments" we find but two preparations in the Pharmacopœia—the *unguentum simplex*, composed of lard 80 parts and yellow wax 20 parts, and the *unguentum aquæ rosæ*, of expressed almond oil 50 parts, spermaceti 10, white wax 10, and rose-water 30 parts. The *unguentum simplex* is a good combination—much better for general use than simple lard; but, on the other hand, it is often found to be too hard, and ointments made with it will often be difficult of application, and when made up for some time with other ingredients, will become too stiff for ready use; as ordinarily kept in drug-stores it has not infrequently been found quite rancid.

The best ointment of all, when fresh and properly made, is the *unguentum aquæ rosæ*, the cold-cream of the Pharmacopœia. But some judgment and skill is necessary in its preparation, for unless very perfectly compounded, with prolonged rubbing together of the ingredients, the ointment will not be perfect; in summer, also, it will require rather a larger proportion of the spermaceti and white wax in order to have the proper consistency for a perfect application. Very frequently, when the skin tends to be too dry, a portion of the water may be replaced by glycerin. Occasionally the odor of the rose-water is not agreeable to the patient, and simple distilled water may be used in its place. The water held in this ointment is undoubtedly an important element in its remarkable effects on the skin, for the *ceratum cetacei* and *unguentum cetacei* have quite a similar composition, but are by no means agreeable to most skins.

When the various products of petroleum, known in the Pharmacopœia by the general name of *petrolatum*, were introduced, it was thought they would furnish the best possible bases for ointments, and that they would rapidly supersede all other excipients; in Dr. Bulkley's opinion they will never supplant those already mentioned and others of recognized value. They are by no means always agreeable and non-irritating to the skin; indeed, many individuals are found who cannot bear them on the skin at all. Most of them have not body enough to form good ointments, although for simple inunction, as a lubricant, or for the application of carbolic acid to the skin as an antipruritic, vaseline serves the purpose very well.

Recently, when lanolin, and subsequently aguine, were presented to the profession, it was expected that this substance would replace other ingredients as an excipient for ointments. But again we have been disappointed, and lanolin forms but a very small portion of the base of ointments used by those especially occupied with diseases of the skin. It is too sticky and not easy of application, and, moreover, it will often prove irritating to a delicate skin. While it was thought to afford a means for the more ready absorption

of medicaments, more experience has shown it to be questionable if this is the case. Indeed, in some experiments by Brooke, it was shown that the substances incorporated with lanolin were the slowest in entering the system. Lanolin, is, however, useful as an addition to certain ointments, in the proportion of about 20 per cent., to give an adhesive quality to them, thus securing a firmer and more adherent coating for affected parts.

Of some forty officinal ointments, very few can be prescribed as they are with advantage in diseases of the skin. Thus the carbolic ointment is made of a strength of 10 per cent., which is far too strong for most skins; whereas the tannin ointment of the same strength is too weak to be of real service. The belladonna ointment is also of the same strength, and is capable, if used at all freely, of producing serious constitutional effects. Also, the officinal ointment of chrysarobin should be diluted for most skins.

Eight ointments are officinal containing preparations of mercury. Of these the blue ointment, containing 50 per cent. of metallic mercury, is well known and of great value; but for inunction on most skins it requires dilution by one-half, in order not to excite too much local irritation. White precipitate ointment has commonly to be diluted two or three times, even in psoriasis and seborrhœic eczema. The red iodide ointment is of fair strength, but to be effective in lupus, or where its corrosive power is required, it should be employed much stronger. Citrine ointment, one of the best known of the mercurial applications, is far too strong to be freely used. When diluted two to four times, it often serves a good purpose in reducing infiltrations of the skin. The yellow and the red oxide of mercury require to be very greatly diluted for use about the eyes.

The single ointment of iodine is a good preparation, containing a trifle of iodide of potassium. A prescription which is of great service in reducing glandular enlargements in syphilis, is a mixture of iodine ointment with the ordinary mercurial ointment in equal parts. When well rubbed together an ointment of the green iodide of mercury is made, which acts much more quickly than either of the ointments alone. For delicate skins it may require some dilution, but generally it is well borne. It is useful as a parasiticide in ringworm and favus of the scalp.

The *unguentum picis liquidæ* is an excellent remedy, composed of equal parts of tar and suet; but it is far too strong for general use undiluted. When combined with oxide of zinc and rose ointment it forms one of the most perfect applications known for a large share of cases of subacute eczema, both in children and in adults:

℞.—Ung. picis . . . . . ʒij.
Ung. zinci oxidi . . . . . ʒss.
Ung. aquæ rosæ . . . . . ℥iv.—M.

The ointments of the carbonate of lead and iodide of lead, each 10 per cent., are also good combinations.

The latter is certainly an excellent means for causing absorption of enlarged strumous glands. The stramonium ointment, containing 10 per cent. of the extract of stramonium, is likewise a good application, and forms a most valuable base for combination with acetate of lead and opium in the treatment of hæmorrhoids.

There are four ointments containing sulphur, only one of which, the *unguentum sulphuris*, containing 30 per cent. of sublimed sulphur, is well known or much used. This is also too strong for direct application to most skins; diluted two or three times with a little storax, and perhaps a little tar ointment, it forms an excellent treatment for scabies, although the more agreeable applications of naphthol and resorcin have largely taken its place in dermatological practice.

The oxide of zinc ointment of our Pharmacopœia is a fairly good preparation. It is made with benzoinated lard, which is not agreeable to all skins: it is sometimes rancid and irritating in cases in which a freshly prepared zinc ointment in cold-cream is grateful and healing.

Diachylon ointment, when freshly and properly made, is one of the most valuable means of local therapy known for many diseases of the skin. The preparation made according to the original formula of Hebra, and given in the German Pharmacopœia, is a soft, buttery ointment, easily spread, and of a delightfully soothing character to most skins, and is decidedly superior to the ointment made according to the U. S. Pharmacopœia.

A few words may now be added in regard to the actual preparation or compounding of ointments, a feature which continually requires the attention of the physician, if he would have success in the treatment of skin diseases. It is desirable for the physician to frequently inspect the ointments or other preparations which are being employed, and to test them by smelling, feeling, rubbing on the skin, etc.

More harm is commonly done by too strong ointments than is usually supposed. The skin is a sensitive and irritable organ, and more often wants to be treated considerately and soothed into good action than it does to be stimulated and irritated. It is well to begin with a mild preparation, increasing the strength as circumstances seem to demand.

It is also well to remember that the average patient, who has not heretofore been instructed, or who has not had special experience, knows nothing in regard to the best mode of application of an ointment, and if the highest degree of success is to attend the use of any particular remedy, it must be only by its proper employment. Careful directions should, therefore, always be given to patients exactly how to apply ointments.

Where it is desired to keep a part continually under the effect of an ointment, it should be soaked in it, if it were possible, as completely as though the part were immersed in a very large mass of the same; but as this is not possible, we have recourse to lint, and the ointment, which should always have considerable body, is spread to a very thick layer on the woolly side of the lint, and then firmly bound on the part.

An excellent illustration of the necessity for minute directions in regard to all these data is found in connection with eczema of the scrotum. When treated carelessly, or when the patient merely smears on an ointment, the disease will prove most distressing and rebellious; but when, on the other hand, very minute directions are given in regard to the sudden and brief application of hot water once daily, at bedtime, and when the part is quickly dried and enclosed in a piece of lint spread with the tar and zinc ointment previously alluded to, and covered by a suspensory bandage, the patient has

complete relief, and with proper accompanying treatment can surely be cured, and that with reasonable speed.

The demand in dermatology is not so much for new drugs, applications, or methods of treatment, as it is for the diffused knowledge of what is already known to be of service, and the faithful carrying out of methods which experience and observation have proved to be useful.—*Therapeutic Gazette*, August 15, 1891.

The Toxicity of Salol.

Although salol has been very freely used, both among children and among adults, and although it has come to be regarded as one of the least dangerous of the new remedies having antiseptic and antithermic properties, there are not wanting clinical testimonies which tend to show that, under certain circumstances at least, its use may be attended with a fatal result. Two cases of fatal result attending its use have been reported, one in which a fifteen-grain dose of salol was used. In this latter case the patient was suffering from severe gastric symptoms, and was under examination according to Ewald's method. After taking the dose the patient became restless and unconscious, the pupils were dilated, the pulse was irregular, there was constant vomiting, and the urine became dark and contained salicylic acid. Death occurred twelve days later. At the autopsy there were found gastritis and hemorrhagic enteritis, a gastric ulcer cicatrized at the cardiac end, chronic endometritis, and a cyst of the ovary. No doubt was entertained that the salol had been the cause of the symptoms of poisoning.

Naphthaline as a Vermifuge.

Dr. Mirovitch, in the *Mercredi Médical*, speaks of naphthaline as the best agent for expelling tænia. In his opinion it is superior to all other remedies, because of the certainty of its action and the absence of all toxic effect, for it is absorbed in but very minute amount by the gastro-intestinal mucous membrane. The dose for adults is fifteen grains, given when the stomach is empty and followed immediately by two tablespoonfuls of castor oil. Children may take from four to eight grains, and at the same time a tablespoonful of castor oil, flavored with a few drops of essence of bergamot. During the two days preceding the administration of the drug the patient is to eat freely of salted, acid, and spiced foods. In all of the cases one dose of naphthaline was sufficient to expel the tapeworm, the head included, even in cases in which other drugs had failed. He has also found the drug most effective in the treatment of patients with ascarides.

Use of Pure Benzole in Whooping-cough.

Dr. W. Robertson, after some years' experience with the use of benzole in whooping-cough, is satisfied that it effects better results than all the other remedies recognized as useful in this affection. In adult and child it is of equal benefit. In an infant just now under treatment the attacks have been reduced from twenty or thirty in the night to two or three, and whereas

when the treatment was begun evidences of bronchitis were present, now the chest is clear, and the child able to be taken out of doors daily. All this improvement was brought about in less than ten days. In cases where convulsions and other complications were fast reducing all chances of recovery, its use was attended with perfect success within a few days. In adults, where pertussis assumes often serious aspects, benzole has proved equally efficacious. Two minims in mucilage are sufficient for a child six months old, and five minims in mucilage on sugar or in capsule, for adults. Whenever the benzole odor is observed in the breath of the patient, then all anxiety as to the result may be allayed.—*Lancet*, vol. ii., No. 6, 1891.

Antipyrine as a Hæmostatic.

Professor G. Cesari, of Modena, finds that antipyrine applied to an injured bloodvessel or to living tissues, whether in the form of fine powder or watery solution, does not irritate or dry or produce any caustic effect on the tissues or cause pain. It gives rise to local anæmia more or less marked according to the length of time the agent is applied. A fifty to one hundred per cent. watery solution produces no change in the calibre of the capillaries; but made to bathe the veins of the mesentery of a frog, or the jugular or femoral vein of a rabbit, more or less perceptible narrowing of these vessels can be observed. When applied in solutions containing at least fifty per cent. of antipyrine, or in the form of powder, in both cases the application should be made on plugs of cotton-wool; it arrests hemorrhage more or less speedily.

Antipyrine, if placed in contact with blood at its normal temperature, thickens and condenses it, and, without causing coagulation, prevents it from escaping from the vessels. It stops secondary hemorrhage.—*British Medical Journal*, 1891.

Removal of Superfluous Hair.

Dr. E. O. Leberman offers the following formulæ, which, in his hands, have proved quite successful. (This formula is recommended by McCall Anderson):

℞.—Barii sulphidi . . . . . ʒiss.
Zinci oxidi . . . . . ʒvj.

Mix with sufficient water to form a paste, apply for three minutes, and then wash off.

For the removal of stiff, coarse hair, the formula of Neumann is serviceable:

℞.—Calc. hydrat. . . . . ʒiss.
Orpiment. . . . . ʒiij.
Amyli . . . . . ʒj.
Aq. calcis . . . . . q. s.

Ft. pasta.

The paste should be spread over the parts from which the hair is to be removed as thick as the blade of a knife. The softened hairs should be scraped from the skin with a dull knife or ivory spatula, the parts washed

with warm water and afterward thoroughly dried. A bland ointment should then be applied to the reddened surface. The length of time these pastes should remain upon the skin is best determined by the severity of their action. They both cause slight itching, which sensation is followed by an intense burning; when the latter begins the paste had best be removed. The effect of chemical depilatories can scarcely be more than temporary, as their action can extend no deeper than the epidermis; the hair-bulbs remaining, a new growth will soon appear. Great care should be exercised in their application, and their effects should be carefully watched, for sometimes deep and painful ulcerations occur by their incautious use. However, they serve a purpose, and if properly applied will often leave the skin free from hirsute appendages which disfigure it.

For Corns and Warts.

A mixture of one part each of lactic acid and salicylic acid in eight parts of collodion is recommended as an excellent application to warts or corns, effecting their removal in a short time.

Menthol in Hay Fever.

Dr. Lennox Wainwright has found menthol of great service in hay fever. It acts best when mixed with carbonate of ammonium, and used as smelling-salts. Patients state that all irritability disappears, and in many cases they get no return of the symptoms.—*Medical Record*, vol. xl., No. 9, 1891.

Common Thyme in Whooping-cough.

Common thyme, which was recommended in whooping-cough three or four years ago by Dr. S. B. Johnson, is regarded by Dr. Neovius, who writes a paper on the subject in a Finnish medical journal, as almost worthy of the title of a specific. During an epidemic of whooping-cough he had ample opportunities of observing its effects, and he came to the conclusion that if it is given early and constantly it invariably cuts short the disease in a fortnight, the symptoms generally vanishing in two or three days. They are liable to return if the thyme is not taken regularly for at least two or three weeks. He gives from one ounce and a half to six ounces per diem, combined with a little marshmallow syrup. It may produce a slight diarrhœa. It is important that the drug should be used quite fresh.

Hypodermatic Injections of Strychnine in Ten Cases of Chronic Alcoholism.

Dr. Ergloski has published an account of ten cases of chronic alcoholism among his patients. They had the habit of taking brandy. They were given subcutaneous injections of nitrate of strychnine, one-sixtieth to one-twentieth of a grain at each injection.

After a dozen injections the results were remarkable, as they all acquired a distaste for brandy. In such cases as are desirous of being cured this treatment may prove to be of assistance.—*Bulletin Général de Thérapeutique*, No. 20, 1891.

MEDICINE.

UNDER THE CHARGE OF

W. PASTEUR, M.D. Lond., M.R.C.P.,

ASSISTANT PHYSICIAN TO THE MIDDLESEX HOSPITAL; PHYSICIAN TO THE NORTHWESTERN HOSPITAL FOR CHILDREN;

AND

SOLOMON SOLIS-COHEN, A.M., M.D.,

PROFESSOR OF CLINICAL MEDICINE AND APPLIED THERAPEUTICS IN THE PHILADELPHIA POLYCLINIC; PHYSICIAN TO THE PHILADELPHIA HOSPITAL.

The Nature, Action, and Therapeutic Value of the Active Principles of Tuberculin.

Dr. William Hunter (*British Medical Journal*, 1891, No. 1595) writes that Koch's remedy for tuberculosis is a glycerin extract of pure cultivations of tubercle bacilli.

"The only substance capable of fulfilling, although still with difficulty, all the conditions laid down by Koch for his active principle would, in Hunter's opinion, be one of crystalloidal nature—presumably a toxine. Such a body might (1) be in sufficiently close association with one of proteid nature as to be carried down when the latter was precipitated by absolute alcohol, and yet (2) at the same time sufficiently loosely attached to be dialyzable away. Further, it might (3) be able to resist the action of high temperature without losing its poisonous properties. On the other hand, a protein substance which would readily fulfil the first and third conditions could not possibly fulfil the intermediate one of dialyzing easily through the parchment membrane. And, lastly, a poisonous peptone which could fulfil the condition as regards precipitation by alcohol, and might also fulfil the one as regards easy diffusibility, could with difficulty fulfil the third one of being unaffected by heat."

Hunter's observations, commenced in January of the present year, have had for their object:

1. To isolate the constituents of tuberculin, and to determine their chemical nature.

2. To ascertain their action with special reference to their power of inducing the two most characteristic effects of tuberculin—namely, local inflammation and fever.

3. To ascertain how far it was possible to eliminate all substances having an injurious action, and thus to obtain its remedial, without any of its injurious, effects.

"SUMMARY OF RESULTS.—In their order of importance, as well as of amount, the chief substances present in tuberculin are, according to these observations:

"1. Albumoses; chiefly proto-albumose and deutero-albumose, along with hetero-albumose, and occasionally a trace of dysalbumose.

"2. Alkaloidal substances; two of which can be obtained in the form of the platinum compounds of their hydrochlorate salts.

"3. Extractives; small in quantity, and of unrecognized nature.

"4. Mucin.

"5. Inorganic salts.

"6. Glycerin and coloring matter.

"So far as the observations go, the following substances are absent from tuberculin, namely, serum-albumin, globulin, peptones."

With the view of ascertaining to which of these bodies or groups of bodies tuberculin owed its characteristic properties, observations were made first on animals—mice and guinea-pigs—and subsequently on tuberculous patients. The following modifications of tuberculin were employed:

Modification A: This contained the total precipitate thrown down from tuberculin by the action of absolute alcohol. The solutions of this precipitate were found to contain every constituent of tuberculin; but the proportion of albumoses was relatively increased, that of salts relatively diminished.

Modification C was the counterpart of A, the salts and other soluble substances being relatively in excess, while the amount of albumose was relatively small.

"The most interesting contrast was afforded by the action of these two modifications, A and C. Both of them had remedial properties, causing absorption and disappearance of tuberculous tissue; but while in the case of A this was attended by decided and occasionally severe local inflammatory reaction, even with small doses, accompanied by comparatively little, sometimes no fever, in the case of C the improvement was attended with no local inflammation, and nevertheless high fever."

Modification B: In this the whole of the albumoses of tuberculin were precipitated by means of ammonium sulphate, so far at least as that was possible without the aid of heat or acetic acid. The precipitate was then taken up in distilled water and dialyzed.

"The solution thus prepared was found to possess in an eminent degree the power of inducing local reaction, followed by healing change around tuberculous lesions, unaccompanied by any constitutional disturbance whatever."

A fourth modification, C B, prepared from C, yielded a solution which gave all the reactions characteristic of albumoses (the salts having been separated by dialysis) and proved to be capable of inducing very distinct local improvement, unattended with fever (in most cases) and still more markedly accompanied by scarcely noticeable inflammatory reaction.

Dr. Hunter summarizes his conclusions as follows:

"1. Tuberculin owes its activity not to one principle, but to at least three, and probably more, different substances.

"2. Its action in producing local inflammation, fever, and general constitutional disturbance is not a simple but an extremely complex one.

"3. Its active ingredients are of the nature of albumoses, alkaloidal sub-

stances, and extractives. The action of these is in certain instances antagonistic.

"4. Its remedial and inflammatory actions are connected with the presence of certain of its albumoses, while its fever-producing properties are chiefly associated with substances of non-albuminous nature.

"5. The albumoses are not lost by dialysis, the latter are. By the adoption of suitable methods it is thus possible to remove the substances which cause the fever, while retaining those which are beneficial in their action.

"6. The fever produced by tuberculin is thus absolutely unessential to its remedial action.

"7. The same holds true, I would fain believe, with regard to the inflammation produced by it. Inflammation is certainly not absolutely necessary for the manifestation of its remedial action. It is in some cases, however, beneficial, and helps, under certain circumstances, the action of the remedial substance.

"8. The difference between the substance which causes the inflammation and the one which possesses the remedial properties as regards their action is not merely one of degree. The local reaction which occurs with small doses of the former is much greater than that producible by large doses of the latter.

"9. Nevertheless the remedial substance has as truly a local action as the one which tends to produce inflammation. This is evidenced in two ways—first, by distinct and obvious shrinking of the tuberculous tissues; and, secondly, increased scaling, pointing to the existence of a certain amount of deep local congestion. In some cases this congestion becomes obvious by slight superficial reddening.

"10. The power of favoring recurrence, which tuberculin possesses, is connected partly with the non-albuminous substances removable by dialysis, possibly also with a portion of the albumoses present.

"11. The remedial substance resists the action of high temperatures. Its action is, however, lessened if exposed to a temperature above 70° C. in a dry condition. Its properties, moreover, can be altered in other ways, sometimes, for example, materially by dialysis. This change is not due to the passage of the substance through the membrane, but to changes occurring in it within the dialyzator. Its sensitiveness in this respect I regard as one of its chief features, and causes its preparation to be attended with special difficulties.

"12. Both it and the albumoses present probably belong to the class of proteins—albuminous substances derived from the plasma of the bacilli themselves, and not merely formed by the action of these bacilli on the surrounding tissues."

As regards the therapeutic value of the above modifications of tuberculin, Dr. Hunter speaks in very guarded terms.

To justify the claim to be classed as a remedial agent, every substance must fulfil the following simple requirements: 1. It action must in a suitable proportion of cases be beneficial. 2. In competent hands its action must not at the time produce any immediate ill effects. 3. Its action must not be followed by remote ill consequences directly traceable to it, still less by consequences which may endanger the life of the patient.

Judged by this standard, tuberculin cannot be regarded a safe remedy, and any modification of tuberculin must be subjected to the same test and

fulfil the same requirements before it can be regarded as a safe remedial agent.

Modification A and modification C are not recommended for use.

Modification C B fulfils the first condition, and so far also the second. It contains the remedial agent present in C without the fever-producing qualities of the latter. The absence of local reaction other than a very slight reddening gives it great advantages if it be employed for internal tuberculosis.

Modification B contains the remedial properties of C B, with the additional property of inducing local inflammation. It fulfils the first condition, and so far the second, with the exception of producing local reaction. The crucial condition to be fulfilled is, however, the third, and time alone can decide this.

The author is of opinion that the action of the various substances has been materially intensified by the process of purification.

Osteomalacia in Insane Patients.

Dr. David Walsh (*Lancet*, 1891, No. 3543) records four cases occurring among a population of 1300 women in Wakefield Asylum. A post-mortem examination was made in three cases, the fourth was still living. One woman had borne "several," another three, the third two, whilst the fourth was childless. The average age at which the disease was first noted was sixty-eight. (Cf. the conclusions arrived at by Durham in Heath's *Dictionary of Surgery* from the analysis of 145 collected cases, "that the great majority began to suffer between twenty-five and thirty-five years of age.")

In three of the author's cases chronic rheumatism was suspected; in three fractures took place from trifling causes, and though not absolutely proved, fracture was probably present in the fourth.

In all four cases there was aortic valvular disease.

One of the patients showed epilepsy of many years' duration, winding up with a rapid final development of osteomalacia and of phthisis.

The life history of the patient who is still alive is remarkable. Springing from a mentally affected family, she first came under treatment for delusional insanity at the age of sixty-six, and was readmitted at seventy for a similar complaint. An aortic murmur was noted at seventy-one, and fractured hip occurred one year later with well-marked osteomalacia at seventy-five, and, lastly, a scirrhus of the mamma at seventy-nine.

The author lays especial stress on the advanced age, absence of frequent child-bearing, and the coincidence of aortic disease with recurrent attacks of delusional insanity.

Local Miliary Tuberculosis in the Course of Treatment with Tuberculin.

Tangl (*Deutsche medicin. Wochenschr.*, 1891, No. 19) reports the fatal case of a man, twenty-five years old, admitted to the wards of A. Fränkel, in the Berlin Urban City Hospital, with pulmonary and laryngeal tuberculosis, in whom, in the course of treatment with tuberculin, tuberculosis of the tongue developed. The case had been demonstrated by Fränkel to the Berlin Medical Society. When admitted to the hospital the patient presented the evidences of pulmonary and laryngeal tuberculosis of moderate degree,

without excavation, or more than slight superficial ulceration respectively. At the end of six weeks, during which he was treated with injections of menthol, gaining weight, and the disease not progressing, injections of tuberculin were begun. Two weeks later, after 0.1 gramme of tuberculin had been given in fourteen injections, there appeared at the anterior margin of the right side of the tongue, which hitherto had not shown the slightest evidence of involvement, a number of small, whitish vesicles, some of which ruptured, leaving superficial, painful, aphthous ulcers. The tongue now became reddened and indurated; small nodules appeared, while the ulceration extended. In the pus removed from the ulcers tubercle bacilli were found. Subsequently there developed in the right half of the tongue a large mass, at the periphery of which ulceration took place, while in the area beyond the ulceration numerous miliary and submiliary nodules developed. A bit of the callous margin of the ulcer and three nodules were excised for histological examination. A week later numerous new nodules had developed, while some of the older appeared grayish-white. Of the latter, a number were excised for histological examination. In this way the condition of the tongue progressively advanced. Deglutition became difficult, the vital forces rapidly failed, dyspnœa increased, and death ensued three months after the treatment with tuberculin had been begun. Diarrhœa was present during the last three weeks of life, the stools containing tubercle bacilli.

The autopsy was made twelve hours after death. The lungs were extensively involved in the tuberculous process; the left lung contained a cavity as large as a fist, lined with cheesy matter. The larynx was the seat of profound ulceration and advanced perichondritis. The large and small intestine were involved in extensive and profound ulceration. The mesenteric and bronchial glands were enlarged and cheesy. The liver, spleen, and kidneys contained numerous gray, translucent, miliary tubercles. The tongue presented the conditions indicated during life.

The treatment with tuberculin, which was withdrawn eighteen days before death occurred, covered in all seventy-eight days, forty-eight injections, a total of 1.165 grammes being given; the initial dose was 0.001 gramme, the final dose 0.06 gramme. Examination, by approved methods, of the tissues excised clearly demonstrated the tuberculous nature of the ulceration, established that the gray nodules that were constantly forming were true miliary tubercles of recent origin, and failed to disclose any evidence of unusual necrosis or unusual inflammatory small-celled infiltration.

In a discussion of the origin of the tuberculosis of the tongue, two possibilities may be considered: either the bacilli were present in the tongue before the injections were begun, or they were carried thither in the course of the treatment. If the bacilli were primarily present they must have been few in number; they could not have been abundant without giving rise to evident changes. Granting that bacilli were present, it follows that treatment with tuberculin did not prevent their rapid multiplication; on the contrary, the nodules that appeared afresh from time to time could only have been developed as a result of renewed deposition. It is more probable, however, that the bacilli reached the tongue during the course of treatment. This they may have done either through the blood or

lymph, or through the sputum. Unfortunately, the primary ulceration was not examined for tubercle bacilli. It is known that aphthous ulcerations heal notwithstanding the presence of tubercle bacilli in the sputum; while, according to the experiments of Koch, local inoculations in tuberculous animals are not progressive. The actual mode of infection of the tongue cannot therefore be definitely determined. There can be no doubt, however, that the tubercles developed adjacent to the ulceration were of local origin, the largest in size and number being nearest the area of ulceration, around which they were clustered in a corona. The histological examination, in conjunction with the clinical course of the case, makes it apparent that some of the nodules examined could have been but a few days old, having developed in the course of treatment. The conclusion forces itself upon one that in the case reported tuberculin failed both to prevent the development of new tuberculous masses and to exert any curative influence upon the processes that existed.

Tangl disclaims any wish to make general deductions as to the utility of tuberculin. He rather considers the case as one of a number in which, for reasons not yet known, tuberculin fails to exert any beneficial influence. A careful study of such cases may lead to a knowledge of the conditions that interfere with the favorable action of the remedy, or contraindicate its application. At the same time, the cases must not be ignored in which tuberculin undoubtedly exercises a favorable influence.

Allochiria.

Weiss (*Prager medicin. Wochenschr.*, 1891, No. 24) reports the case of a woman, fifty-four years old, with a neuropathic heredity, who had for a number of years presented typical symptoms of locomotor ataxia. In addition, the patient was hysterical and a victim of morphinism. Beside the ordinary manifestations of tabes, she presented bilateral ptosis, bilateral temporal hemianopsia, decided salivation, tachycardia, laryngeal and gastric crises, and an excessive (trophoneurotic) formation of callus at the seat of an old fracture of the tibia; a tendency to melancholia, an impairment of memory and a pseudo-paralysis of the lower extremities that existed, were ascribed to the hysteria. On testing sensation, it was found that impressions made upon one side of the body were referred to the corresponding point on the opposite side: stroking the skin of the lower extremity, the prick of a needle, the application of a hot sponge and of a bit of ice, the passive fixation of the great toe, of the foot, and of the knee, were all recognized, but referred to the opposite extremity. There thus existed allochiria of tactile sensibility of the pain, of the temperature, and of the muscle-sense.

Weiss considers as plausible Hammond's explanation of the occurrence of allochiria: an obstruction in the cord that diverts a sensory impression made upon one side of the body to the same side of the brain, as a result of which the impression is referred to the opposite side of the body. The disappearance of the symptom that commonly occurs may depend upon structural removal of the sensory obstruction. Weiss believes that the phenomenon would be more commonly encountered if careful sensory examinations were habitually made.

Albuminaturia.

In a communication presented to the Société de Biologie, Gaube (*La Médecine Moderne*, 1881, No. 23) described as albuminaturia a condition characterized by the presence in the urine of a small quantity of albumin in association with carbonates, or especially with earthy phosphates. Albuminaturia may be physiological, pathological, or experimental. Physiological albuminaturia is transitory; it accompanies pregnancy; in both sexes it follows coitus; in the female it follows menstruation. Pathological albuminaturia is protracted in duration and of grave prognosis; it appears in the course of extensive suppuration, or associated with changes in the nervous system. Experimental albuminaturia is a result of the stomachal ingestion of an excess of phosphates soluble in the urine, of which the excess is eliminated as albumino-phosphates. Calcic albumino-phosphate, the most abundant in the urine during the existence of albuminaturia, is a combination of albumin with the bibasic calcium phosphate, and has a rotatory constant of —92°. The urine of albuminaturia is scanty; it contains but a small proportion of urea, of mineral matters, and of phosphoric acid; it is scarcely acid; filtered, not acidulated and heated, a precipitate of the bibasic calcium phosphate is thrown down, soluble by the addition of one or two drops of acetic acid; the solution of the precipitate is followed by a cloudiness of the urine, dependent upon precipitation of albumin, insoluble by heat or acids, but soluble in alkalies. Albuminaturia is distinguished from ordinary albuminuria or serumuria, in addition to other physico-chemical characteristics, by the preponderance in the urine of the mineral over the proteid matters; in serumuria proteids predominate over mineral constituents.

Danger of Breaking-down Capsules about Colonies of Bacilli.

In an address made before the Medical Society of Hanover, in March, 1890, Brunn-Lippspringe (*Deutsche med. Wochenschr.*, Jan. 22, 1891) referred to the irregularity of the nasal surfaces, the tortuous course and progressively narrowing lumen of the air-passages, with their ciliated epithelium and constant outward current of mucus, as natural protections against the invasion of infection and the entrance of bacilli into the deeper respiratory passages. In the event of infection taking place, the bacilli passing the pulmonary portals and gaining entrance into the alveoli, where they find the conditions for the development of their activities, the organism makes a final effort to rid itself of the invaders; failing in this, it endeavors to prevent their entrance into the blood. The colony of bacilli is surrounded by a wall of living cells; the latter destroy or isolate the former, cutting off their nutrition and preventing general infection. As a result of mechanical or chemical irritation a connective-tissue capsule is formed. The slow development of the tubercle bacillus accounts for the long period of incubation of tuberculosis, and affords abundant time for the formation of a surrounding capsule. In this way the prolonged localization and the slow extension of the disease find explanation. In the absence of a specific remedy for tuberculosis, the therapeutics must be so directed as to supplement the efforts of Nature, by favoring the development of the protecting capsule, an end best accomplished by

elevating the nutrition, improving the general condition, and regenerating the blood and bodily fluids. If this view be correct, any procedure which causes destruction of the surrounding capsule, with setting free of the bacilli, carries with it the danger of dissemination. This is illustrated in the general infection following operative treatment of tuberculous bone disease and of fistula-in-ano of tuberculous character.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE UNIVERSITY AND GERMAN HOSPITALS;

ASSISTED BY

EDWARD MARTIN, M.D.,

CLINICAL PROFESSOR OF GENITO-URINARY SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE HOWARD HOSPITAL AND ASSISTANT SURGEON TO THE UNIVERSITY HOSPITAL.

THE SUPPOSED CURATIVE EFFECT OF OPERATIONS, PER SE.

Under this title, DR. J. WILLIAM WHITE, of Philadelphia, contributes a paper to the *Annals of Surgery* for August, 1891, which, not only from its subject, but from the great number of authorities quoted and from the peculiarly rich experience of the writer, makes an article of unusual interest and importance to both surgeon and physician. The author's attention was first directed to this subject by reason of his experience with the operation of trephining for so-called traumatic epilepsy.

During the past five years, with Dr. D. Hayes Agnew, he has trephined in fifteen cases of supposed traumatic epilepsy. All but one recovered from the operation. The patient who perished was an imbecile and a confirmed drunkard, as well as an epileptic. Death occurred from suppression of urine, probably secondary to etherization.

In one case a bullet was found imbedded in the brain substance; in another an irregular portion of the internal table was dissected out from beneath the dura mater, to which it was attached by cicatricial adhesions. In another there were projecting spicules of bone on the internal surface of the button removed and the adjacent portions of the skull. In two, marked sclerosis and thickening of the cranium were observed about the field of operation. In the remaining cases nothing abnormal was seen. Although this was the case, they were, without exception, markedly improved by trephining, in two instances even to the point of apparent cure, no return of symptoms having been observed for eighteen months and for two years after the operation. In the other seven the results were strikingly favorable, convulsions disappearing for weeks or months, although previously of more than daily occurrence.

The author has, in so far as this is possible, classified the cases in which operation *per se* seemed to be the main factor in bringing about a cure. These cases are divided into three groups, in accordance with the anatomical seat of the symptoms or of the supposed disease. This brings them under the following heads:

1. Operations for the relief of nervous phenomena, as epilepsy, insanity, paralysis, etc.
2. Operations for abdominal and pelvic disorders, as peritonitis, tumors, etc.
3. Miscellaneous operations.

This classification is further carried out by grouping together (*a*) those cases in which nothing whatever was found explanatory of the symptoms; (*b*) those in which some departure from normal conditions was observed, but was so slight as to be apparently inadequate to explain the symptoms; (*c*) those cases in which an apparently grave and irremediable condition was disclosed by an exploratory operation, but notably improved or altogether disappeared after mere inspection and handling, no further surgical interference having been thought justifiable.

Under the heading of "Operations for the Relief of Nervous Phenomena," Dr. White has tabulated, including his own service, 154 cases. Many of these are given in detail, and coming as they do from recognized authorities, are of exceeding great interest.

In 56 cases of trephining for epilepsy nothing abnormal was found to account for the symptoms. Nineteen cases were reported in six months or less after operation; 11 cases were reported from one to two years after operation; 1 was reported eight years after operation.

Of these cases 25 were reported as cured; 18 as improved; in 3 it was mentioned that a relapse occurred later.

In 30 cases of ligation of bloodvessels for epilepsy 14 were reported as cured; 15 as improved; 1 died seven days after operation. In the fatal case the right common carotid artery was tied. No fit occurred after the operation.

In 10 cases of castration for epilepsy all were reported as cured. One case was reported four months after operation; 4 cases were reported more than two years after operation; in 5 the time when reported is not mentioned.

In 9 cases of tracheotomy for epilepsy 2 were reported as cured; 6 as improved; 1 as much improved, though death in this case followed in two months after the operation.

In 24 cases of removal of the superior cervical ganglia of the sympathetic nerves 6 remained well at the end of three years; 10 were improved; 5 remained unimproved; 2 died soon after the operation, but not from its direct effect.

In 6 cases of incision of the scalp for epilepsy nothing was found to account for the symptoms. Three of these cases were reported as cured at the end of one year; 2 were reported as cured at the end of two years; 2 other cases, almost similar, were reported as cured.

Twelve cases of epilepsy are reported as cured by such operations as stretching of the sciatic nerve, excision of the musculo-cutaneous nerve, cauterization of the larynx, circumcision, application of a seton to the back of the neck,

tenotomy of the external recti muscles, burning of the scalp, puncture of the heart, etc.

Thirteen cases of spontaneous or accidental cures of epilepsy are also reported, at a time varying from two months to five years after the traumatism, which was a fall, a burn, a wound, an amputation for intercurrent injury or disease, etc.

Passing from the cerebral to the spinal region, Dr. White cites an illustrative case of his own. A man aged fifty-five years was attacked on December 25, 1887, with severe pains in his arms and shoulders. A few days later there was weakness of the thighs, spreading rapidly down the legs to the feet, and upward on the body to the nipple line. In eight days there was absolute paralysis of the parts involved, including both sphincters, while at the same time the paralyzed parts became the seat of profound anæsthesia. Girdle pains developed, bedsores made their appearance, percussion of the spine over the third and fourth vertebræ became painful. The reflexes were exaggerated, and light blows on the head in the direction of the spinal axis gave rise to frightful exacerbations of the girdle pains. In spite of every remedial measure these symptoms increased in severity for ten months. An exploratory operation was then undertaken. Dr. White removed the spines and laminæ of the first five dorsal vertebræ, opened the slightly thickened dura, separated some firm adhesions to the subjacent pia mater, explored the cord, and having failed to discover any serious pathological changes, closed the wounds in the dura and soft parts.

The girdle pains had entirely disappeared by the following day, sensation began to return in the feet the day after, voluntary motion in the toes after the eighth day, and so one symptom after another disappeared until the patient completely recovered, and is now earning his living by manual labor.

In the list of abdominal and pelvic disorders apparently cured by operation *per se* a number of extraordinary cases are cited. The experience of Tait, who has more than once drawn attention to the astonishing disappearance of tumors, often of large size, after a mere exploratory incision, and the corroborative testimony of Von Mosetig, are cited at length. Koenig's analysis of 131 cases of tubercular peritonitis treated by abdominal incision is carefully discussed.

In response to letters of inquiry upon the subject, Dr. White received many communicatians from prominent operators, the great majority of them containing notes of cases not previously published.

Among the signers of these letters are to be found the names of Goodell, Hirst, Battey, Roswell Park, Lusk, Cheever, Chas. T. Parkes, Cabot, Hunter McGuire, Nancrede, Weir, Stimson, and many others of equal note.

Under the heading of Miscellaneous Operations the author has given several of very diverse character.

First are quoted cases of osteomalacia, cured, after weeks or months of confinement in bed, by either oöphorectomy or Cæsarean section.

Passing to another subject, the question of graduated tenotomy of the eye muscles for the relief of severe nervous symptoms is carefully discussed. The author freely acknowledges the value of tenotomies, both complete and graduated, in the restoration of equilibrium in badly balanced ocular muscles, but he is none the less convinced that in numbers of instances of reported cures

of chronic chorea, *petit mal*, and even delusional insanity, the effect of the operation *per se* is in large measure the potent cause of the supposed cure. This belief is founded not alone on theory but upon the fact that in certain cases of reflex nervous troubles a cessation of the symptoms has followed the tenotomy, although this has not produced perfect equilibrium. Again, the relapses which may take place after a perfectly successful series of tenotomies would indicate that the nervous phenomena attributed to the insufficiency, for the relief of which the operations were made, were not correctly so attributed, and that the temporary relief must be ascribed to some cause other than the restoration of an imperfect balance of the external ocular muscles.

In seeking for a reasonable explanation of the phenomena observed in the above cases, the author has formulated the conditions which are common to nearly all of them. These are:

1. Anæsthesia.
2. Psychical influence, or so-called mental impression.
3. Relief of tension.
4. Reflex, action or the "reaction of traumatism."

These influences were operative in the majority of cases, although not one of them, except the last, applies to the whole list.

With the idea that it was conceivable that a disease of the nerve centres not reached by ordinary drugs might be affected by agents of such volatility and diffusibility as ether and chloroform, the author instituted a series of observations upon a number of epileptics in various stages of the disease. All other treatment was withdrawn, ether was given to the production of full anæsthesia at intervals of from forty-eight to seventy-two hours. The results were either entirely negative, or in consequence of the withdrawal of their bromides the patients grew worse.

Since in the great majority of cases upon which Dr. White bases his paper there were either undoubted symptoms, such as are habitually associated with organic disease, or there was demonstrable and unmistakable evidence of such disease, it is necessary to believe, in considering the psychical influence of operation, that powerful impressions acting upon the emotional or intellectual nature may affect the organic processes of secretion, nutrition, etc., and may arrest pathological changes and bring about reparative or recuperative action. Cases are cited in which such influences are clearly set forth.

The author holds that the normal equilibrium which we witness between the cerebro-spinal and the sympathetic systems as respects their influence upon the bloodvessels is obviously more or less interfered with when the brain transmits a more than wonted impulse, allowing the unrestrained action or paralyzing the influence of the sympathetic vasomotor nerve. In this relation the author narrates some remarkable cases of hypnotism, and quotes some striking examples of the influence of the central nervous system upon the body.

Belief is expressed that in many of the cases described there can be little doubt that relief of tension is an important factor in amelioration or cure. If it is assumed that preternatural tension exists in the cranial cavity, this would be relieved to an extent by trephining, and there would be but few exceptions to the rule, that in each case something was done which lessened tension in

the cavity or organ of the body. There are other cases, however, in which no such relief was obtained, and yet cure resulted from operation. A diminution of the tension would manifestly alter the blood-supply to any important organ in the body, and with it the nutritive processes, local and general. Beyond this nothing definite can be said except as it applies to cases of ascites, in which, as in cases of hydrarthrosis, one tapping may prove permanently curative because the original source of irritation and hypersecretion has already disappeared.

Under the head of Reflex Action, the author includes the "reaction of traumatism," as well as the effects of revulsion and counter-irritation.

Verneuil has long since shown that very slight traumatism sometimes excites in the entire economy a general perturbation, and sometimes, by selection of the weak point, a sudden aggravation of lesions that are only slight or have slumbered. This same excitement, usually prejudicial, may occasionally be curative. In the case of spinal surgery above detailed, Dr. White believes that the local shock of the operation was promptly followed by a corresponding reaction in which the vitality of the tissues was raised sufficiently high to determine a return to the normal state. In this relation the reciprocal influence of one portion of the body on another is briefly discussed.

In considering abdominal tumors, attention is called to the possibility of the spontaneous disappearance of such tumors, the relation of this disappearance to the operation being coincidental; cases are cited in point. As to the cure or amelioration of growths thought to be malignant by merely exploratory operation, a long search through the literature of the subject has met with but little success.

The cure of tuberculosis of the peritoneum as the result of exploratory incision is explained on the ground that the removal of ascitic fluid allows the peritoneal surfaces to fall together and to acquire adhesions. The tubercles are then shut in between the coils of intestine, the omentum, and the abdominal wall. They are thus surrounded by tissues in a high degree of activity, which can now throw around them the limiting zone of young cells and eventually fibrous tissue, which, if the tuberculous process is not too far advanced, may effectually resist it and may cause it to retrograde, the process being analogous to that which we see imperfectly going on around a cancerous growth.

As a result of a study of the subject, the author believes the following conclusions are warranted:

1. There are large numbers of cases of different grades of severity and varying character which seem to be benefited by operation alone, some of them by almost any operation.

2. These cases include chiefly epilepsy, certain abdominal tumors, and peritoneal effusions and tubercle, though the improvement in the latter is, perhaps, to be explained on general principles.

3. Of the possible factors which, by reason of their constancy, must be considered, anæsthesia seems least likely to have been effective. The other three—viz., psychical influence, relief of tension, and reflex action—may enter in varying degrees into the therapeutics of these cases, and taken together, serve to render the occurrence of occasional cures less mysterious.

4. The theory of accident or coincidence scarcely explains the facts satisfactorily.

Deep Urethral Medication in the Treament of Urethral Catarrh.

Some practical suggestions for deep urethral medication in the treatment of posterior urethral catarrh are made by Keyes (*Medical Record*, vol. xv., No. 4), whose position as a genito-urinary surgeon is such as to entitle any of his writings to careful consideration.

He again calls attention to the fact that it is impossible to say exactly what a stricture is, since every natural undulation of the canal may be so classed by the physician who is properly impregnated with the large-calibre-stricture idea, and hence he is sure to find what he looks for in every case of gleet.

Keyes states that the vast majority of chronic gleet cases have already been cut anteriorly in the urethra from one to eleven times, and that very few of them have been tested to ascertain whether they have posterior urethritis or not. He states that one may easily learn how to cure many, and diagnosticate all, cases. Where the trouble is due to anterior urethral catarrh, caused by stricture, granulations, or what not, the source of the pus may be demonstrated without the endoscope by gentle, thorough, hot irrigation of the anterior urethra by means of a soft catheter passed into the sinus of the bulb, and the immediate subsequent use of the simple metallic bulbous bougie, provided the meatus be reasonably large; for if the pus comes from granular or strictured portions of the pendulous urethra, the irrigation will only wash away what lies loose in the canal, and the bulb will subsequently bring forth upon its shoulder soft muco-purulent clots, generally tinged with blood, which have been scraped off the excoriated areas from around which the inflamed mucous membrane secretes whatever free pus exists. There may be tight areas, which the bulb will detect; but if there be not a granulating surface upon the tight area or behind it, which the bloody muco-purulent clots on the shoulder of the bulb will demonstrate, or their absence disprove, then the cutting of such tight areas will not favorably modify gleet in most instances. Even though there may be some tight areas and a moderate condition of granulation, if there is also posterior urethritis the cutting of the tight areas, although it may greatly moderate, will not cure the gleet, and this should be told a patient before such operation is undertaken.

When there is posterior urethritis the quantity of pus lying in the urethra behind the bulbo-membranous junction is disproportionately great when compared with the amount of gleety discharge that appears at the meatus. This may be readily demonstrated. If the urethra be milked by firm pressure with the finger, from the perineum forward, until all the pus that will come be squeezed out, and then the patient be instructed to urinate in two parts, into separate glasses, if he have even moderate posterior urethritis the quantity of pus mixed with the first urinary gush, representing the washing out of the deep urethra, will be disproportionately great when compared with what has flowed out spontaneously from the meatus or been milked out by the physician before the urinary act, as shown by gross inspection of the specimen. And if the grade of posterior urethritis be intense, not only will the first

urinary gush be purulent, but also the entire secondary flow will be turbid with pus. In case of doubt, the anterior urethra may be irrigated before the urinary test is applied. The pus may, of course, come from the prostate gland or the seminal vesicles; but this may be demonstrated by milking of these organs by means of a finger in the rectum, between the first and second urinary flows, urine being retained in the bladder to be ejected in a third urinary discharge, and the specimens to be examined microscopically after settling.

The clinical picture of posterior urethritis is fairly typical. After the subsidence of an acute attack of gonorrhœa, which has, perhaps, been complicated by cystitis or vesical irritability, there follows a mild gleet. So long as the patient uses an injection, his urethra remains dry and he thinks himself cured. On leaving off this treatment, however, the discharge reappears, sometimes accompanied by discomforting sensations in the anterior urethra near the meatus, or referred to the perineum, and sometimes accompanied by urinary urgency and precipitancy. Wines, spirits, or indulgence in sexual intercourse promptly aggravate the gleet. Most of these cases have the anterior urethra widely cut for a close stricture of large calibre, and are subsequently treated by large sounds, often with much benefit; frequently, however, the passage of these instruments aggravates the discharge and lights up either cystitis, prostatitis, or epididymitis. Most of these cases ultimately get well, and without local treatment.

Rest, balsams, alkalies, demulcent drinks, counter-irritations, change of air, treating of the anterior urethra, iron in chronic cases, all of these are potential, and most of these can be happily combined with local posterior treatment. Some few cases are positively unsuited to local treatment and get worse under it. Most tubercular cases, and some simple inflammatory and some ordinary gonorrhœal cases, can be classed in this group. When the treatment disagrees, symptoms become so promptly and obviously aggravated that the futility of repeating applications is at once clear. There is no danger of producing cystitis or epididymitis if instruments are used carefully and not inserted too far; the risk incurred of occasioning these symptoms is vastly less than in treating the disease with anterior injections or sounds and internal medication. The instrument employed is founded upon Ultzmann's model, differing from the latter in being made in one piece. The syringe has only one minute opening at the tip. The latter may be inserted just within the hole in the triangular ligament, that is a trifle beyond the bulbo-membranous junction. The membranous urethra grasps the tip of the instrument, and the contents of the syringe, twenty minims, or more, may be gently thrown in; the entire injection will flow backward along the membranous urethra, through the prostate, and into the bladder, with as little violence as possible, not one drop escaping at the meatus upon the withdrawal of the syringe. Instead of using a few drops of strong solution it is better to use a larger quantity of a mild solution. The entire contents of the syringe should be used in every instance, excepting when nitrate of silver is employed in a strength greater than ten grains to the ounce, The strength of a given substance is increased gradually after establishing tolerance to milder strengths. When the source of the flow of pus is reasonably well forward in the urethra

the injection may be made before the patient urinates; when the inflammation extends further backward, and the supply of pus is considerable, the patient should urinate just before making the injection, so that the fluid will flow into the bladder and become thoroughly applied to the mucous membrane at the internal prostatic urethral orifice, without being diluted or neutralized by coming in contact with urine in the bladder at this point.

In suitable cases the free pus disappears from the second urinary flow, then it disappears entirely from the urine, some shreds still remaining. These are attacked by increasing the strength of the injected fluid, or if there be some stricture in the membranous urethra by the use of sounds, after the catarrhal surface has been modified by the previous employment of injections, combined often with anterior astringent injections, which the patient himself administers.

After an extensive use of the various remedies which have the repute of controlling the flow of pus from mucous membranes, Keyes relies almost exclusively upon four substances—sulphate of thallin, sulphate of copper, glycerole of tannin, and nitrate of silver.

The sulphate of thallin is bland and practically unirritating, and may be used up to a saturated solution, which is about twenty-four per cent. It is suitable in all the acuter forms of inflammation (except cases of acute frank, recent gonorrhœal cystitis, in which the nitrate of silver has the preference), and is the substance which should first be used in a watery solution of about three per cent., increasing at each injection up to six, nine, and even twelve per cent. The last-named strength will usually accomplish all that this drug can do in reducing the free secretion of pus. The intervals between injection should be two, three, or four days, according to the effect. The treatment causes practically no discomfort, and the injection may be retained as long as the patient chooses.

The sulphate of copper is used in the strength of one per cent. in pure glycerin. This solution is given in water, commencing with about one grain to the ounce and working up rapidly to full strength. This drug is markedly astringent in suitable cases.

Where a more astringent effect is aimed at than that produced by copper, the glycero-tannin may be employed. This substance is too thick to be sucked readily into a syringe. It is thinned by the addition of water.

Nitrate of silver is exceedingly valuable in gonorrhœal cystitis, and is most useful when copper and tannin prove inefficient. The first injection should be of the strength of about one grain to the ounce. The applications are made from three to eight days apart, and are increased in strength to ten grains to the ounce. This is the harshest of the applications, but carefully used is free from danger of producing complication, and is very efficient. Thallin and nitrate of silver should not be used in the same syringe, as a black solution is made which is difficult to wash out.

OTOLOGY.

UNDER THE CHARGE OF

CHARLES H. BURNETT, M.D.,

AURAL SURGEON, PRESBYTERIAN HOSPITAL, ETC., PHILADELPHIA.

Operation for the Relief of Deafness, Noises in the Head and Ears, and Vertigo, Due to Chronic Catarrh of the Drum of the Ear.

In this brochure of fourteen pages (*Archives of Otology*, 1891, Part 2), Dr. Samuel Sexton, of New York, gives the results of the operation of excision of the membrana and the two larger ossicula as carried out by him. Very interesting notes of seven cases are given, and Dr. Sexton then says that the list of cases might be extended if space permitted him. He offers the following conclusions:

"In certain cases the advance of progressive sclerosis, and consequent deafness, tinnitus, etc., cannot be arrested, nor, indeed, can any permanent improvement in hearing be made by means of any known local medication, directed either to the ear itself or the throat. On the contrary, valuable time may be frittered away in useless experimentation until the disease has become more and more firmly seated. This is the more lamentable in younger patients, when deafness is but beginning and is therefore amenable to an operation. The deafness due to progressive ankylosis of the ossicula may be arrested in most cases, and where the operation does not improve hearing the further increase of deafness is thus prevented. . . . . All the manipulations in performing the operation are carried on in the ear through the ordinary ear speculum, introduced into the external auditory meatus." The operation is carried on under narcosis, is not attended, therefore, with pain, and there is seldom any reaction or feeling of soreness in the ear afterward. If regeneration of the membrana tympani occur, the new membrane may be cut away after the application of a 10 per cent. solution of cocaine. Regenerative processes are lessened, in Dr. Sexton's opinion, by abstaining from eating meat, both before and after the operation. The aim of the operation, of course, is to maintain an opening into the drum-cavity. An immediate result of the operation is generally an improvement in hearing high tones.

For a few hours after the operation the patient should maintain a recumbent position, and remain in the house a day or two. On the fourth day the patient may go out of doors.

If a new membrana form, the improved hearing may disappear, though this is not invariably the case, as observed by Lucae and by C. H. Burnett.

A New Modification in Boric Acid Treatment of Chronic Suppurative Otitis Media.

This, according to Scheibe (*Münchener med. Wochenschrift*, 1891, No. 14), consists in the direct insufflation of boric acid powder into the drum-cavity

through small perforations. It is to be accomplished by means of a powder-blower with very fine nozzle. All such manœuvres must be regarded as interfering with drainage and liable to induce damming of pus and septicæmic symptoms. [There can be no cure in such cases until perfect drainage is obtained and maintained. This can be accomplished but by excision of the membrana tympani and the two larger ossicula or their remnants.—REV.]

MÉNIÈRE'S VERTIGO AND THE SEMICIRCULAR CANALS.

The experiments of Flourens, which seemed to attribute to the semicircular canals the *rôle* of maintaining the equilibrium of the body, have been controverted by others to such an extent as to make it appear doubtful whether that part of the labyrinth is the seat of the lesion which determines the so-called vertigo of Ménière. The peculiar character of the vomiting, the fact that the latter symptom may occur suddenly without nausea, after irritation of the membrana tympani, the intimate connections between the pneumogastric and the auditory nerve at their origin, renders it more probable that the vertigo and cardiac symptoms are due to a reflex action in the pneumogastric dependent upon a lesion in some portion of the auditory nerve. The term Ménière's disease serves more frequently to mark ignorance of the lesion which occasions a series of symptoms often analogous but which are under the influence of very different causes.—(SIR. WM. B. DALBY, *Brit. Med. Journal*, and *Annales des Maladies de l' Oreille*, etc., vol. xvii.)

AUDITORY AFFECTIONS IN TABES DORSALIS.

E. MORPURGO made a careful examination of fifty-three ataxic patients, and found that only ten possessed normal auditory apparatus.—*Annales des Maladies de l' Oreille*, etc., vol. xvii., 1891.

USE OF COLLODION IN RELAXATION OF THE MEMBRANA TYMPANI.

DR. LANNOIS, of Lyons, France, calls attention (*Annales des Maladies de l' Oreille*, etc., vol. xvii., No. 1) to the above-named treatment, first suggested, he says, by McKeown, of Belfast, in 1879. Employment of collodion has no inconveniences nor dangers, and the author thinks that it not only holds the relaxed membrana in proper position, by its contractive and extracting power, but also that it possesses a truly curative effect, as the patients continue to hear better after the collodion film is removed from the ear.

Two cases are then told in detail illustrative of the good results of this treatment in relaxed conditions of the membrana tympani. McKeown recommended to paint the collodion on the membrana, but Lannois prefers to drop into the ear a few drops of the collodion after the membrana tympani has been pushed into the normal position by inflation of the tympanic cavity.

FORMS OF OTITIS MEDIA PURULENTA IN TUBERCULOUS SUBJECTS.

According to DR. T. BOBONE, there are two principal forms of otitis media purulenta occurring in tuberculous subjects, viz.:

1. A very characteristic form: The membrana tympani presents neither

thickening nor hyperæmia, but at most only a slight rosy blush. In its inferior portion, a perforation is found the edges of which are smooth and sharp. Beyond this perforation is seen the mucous membrane of the drum-cavity, smooth, without granulations or exudation. Hearing is found considerably diminished—even to one-fifth of its normal distance.

2. The second form is seen in those far advanced in phthisis. The membrana tympani is entirely destroyed. An upper arc of the membrana is found in the middle of which the malleus is suspended. The tympanic cavity is lined with a diphtheroid membrane, grayish-white in color, not to be removed by syringing. Later in this affection caries of the petrous bone and of the mastoid apophysis are found. In this advanced form the disease, which appeared first as an indolent otorrhœa, may cause acute pain. Suppuration is slight, but the hearing is greatly diminished.

Of these two forms the first is sometimes curable, or rather arrested *in situ*. The second is incurable, and it is difficult to allay the pain it causes.—*Annales des Maladies de l' Oreille*, etc., vol. xvii., No. 1.

Hemorrhages into the Labyrinth, in Consequence of Pernicious Anæmia.

Dr. J. Habermann, of Prague, has reported a case of the above nature (*Prager med. Wochenschrift*). The patient was a young woman, twenty-one years old, who, with other symptoms of anæmia, became deaf a short time before death. The post-mortem examination revealed cicatrices in the stomach from peptic ulceration, follicular enteritis of the large intestine, intense anæmia, with hemorrhages into the meninges, the brain, the pharynx, pericardium, and small intestine, and also in the retina. Fatty degeneration of the myocardium. The right organ of hearing was examined by Habermann, and the middle ear was found entirely normal. Microscopic sections of the decalcified internal ear showed a normal internal auditory canal and auditory nerve. Numerous minute hemorrhages were seen in the cochlea; otherwise the cochlea was normal. Extensive hemorrhages were found in the vestibule and in the semicircular canals. The symptoms, deafness and roaring in the ears, shown in this case before death, are to be explained probably by the hemorrhages in the labyrinth. The vertigo, which was also marked, may be referred, perhaps, to the hemorrhage in the semicircular canals, or to the simultaneous lesions in the brain.

The Importance of Surgical Means applied to the Naso-pharynx in the Relief of Naso-pharyngeal and Middle Ear Disease.

Dr. C. W. Richardson, of Washington, D. C. (*Journal of the American Medical Association*), writes, among many valuable things, the following: "In showing how inadequate the ordinary treatment of ear affections under the care of the auro-ophthalmologist is, I do not wish it to be understood that I am to any extent an aural nihilist. I am afraid a great many of my medical *confrères* are claiming too much for the independent use of the forceps, cautery, snare, drills and saw (in nose and throat). I doubt very much of their curing all the ills to which the ear is subject, unless they at the same

time resort to a judicious use of aural therapeutic measures. Firmly convinced as I am of the value of naso-pharyngeal surgical methods, I have not thrown away the leech, douche, paracentesis knife, Politzer bag, nor catheter (for the ear); our only safeguard is the judicious use of these means, and the acknowledgment of their just therapeutic value. On the other hand, we must acknowledge the increased successfulness, or aid to success, in otological work rendered by rhinal surgeons; but while acknowledging their achievements one must remember that there are a vast number of aural cases falling under our observation thoroughly independent of any change within the naso-pharyngeal cavity, the relief of the one not arresting the retrogressive progress of the other." The author alludes to sclerotic cases with patulous Eustachian tubes. In these cases, if the patient is to have relief, he "must get it through aural therapeutic measures employed in the hands of the skilled otologist." It is nonsense for one to agitate ideas having in view the condemnation of otological therapeutic methods—they have a vast field of usefulness. What is desirable is that the aurist should become more of a rhinologist, and the rhinologist more of an aurist. Unfortunately, "one does not find in aural clinics that careful examination and treatment of the naso-pharyngeal cavity as is carried out in rhinal clinics, nor in rhinal clinics that same care and attention to the ears that one finds in aural clinics; and an appreciation of the inadequacy of the routine treatment of the case as resorted to by the auro-ophthalmologist."

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

J. SOLIS-COHEN, M.D.,

OF PHILADELPHIA.

Morbid Growths of the Larynx.

A globular laryngeal tumor, about twelve millimetres in diameter, removed by Dr. F. H. Hooper, of Boston, from the anterior portion of the left vocal band and ventricle of a man fifty-three years of age (*Medical Record*, March 7, 1891, illustrated), was found on microscopical investigation to be a telangiectatic myxofibroma in a state of amyloid degeneration.

M. Garel, of Lyon, reports (*Arch. Internat. de Lar.*, etc., 1891, No. 3) the spontaneous recession, after tracheotomy, of a papilloma occupying the entire left vocal band and the inter-arytenoid commissure of a child, four years of age, and occurring as a result of laryngitis contracted in sequence to an attack of influenza.

At the last meeting of the Pathological Society of London, Dr. F. Semon and Mr. Shattock (*Medical Press and Circular*, May 27, 1891) showed a papillomatous tumor which had been removed by the former from the left ary-epiglottidean fold of a man, forty-four years of age, and which, prior to

its examination after being taken from the throat, was thought to be an angioma. It was completely surrounded by a shell of blood-clot, and this, together with the unusual position of the growth and the spontaneous hemorrhage occasioned by its presence, were the chief features of interest presented in connection with it.

DR. LUC reports (*Arch. Internat. de Lar.*, etc., March-April, 1891) an instance of multiple or diffuse fibro-adenoma of the laryngeal and pharyngeal mucous membrane. A soldier, twenty-six years of age, had some difficulty in glutition in the summer of 1889, for which he was subjected to nine months' active treatment with iodides without effect. When seen by Luc, in June, 1890, a rounded reddish-gray tumor the size of a nut was observed behind the right palatine fold. The larynx was obstructed by a number of similar tumors of varying size, in front of the arytenoid cartilages and along the posterior and lateral walls of the larynx. They were removed after protracted operative procedures with the incandescent electric snare, the electric cautery, and cutting forceps. Subsequently a similar tumor of large size was discovered on the superior surface of the soft palate, whence it was excised with cutting forceps. Adenoid vegetations existed in abundance, which were removed with Gottstein's knife. These growths were found by Dr. Dubar to be formed in great part of fibrous tissue, with well-developed glandular acini at various portions.

An instance of a very large myxoma of the larynx is recorded by M. AD. DUDEFOY from the laryngological clinic of the Hôpital Lariboisière (*Annales des Mal. de l'Oreille, du Larynx*, etc., April, 1891). A male cook, forty-six years of age, had been treated for some time as a subject of laryngeal tuberculosis. Personal and antecedent history was good. Inspiration was easily accomplished, but expiration was difficult. Exertion exaggerated the dyspnœa and produced temporary cyanosis. The respiratory difficulty had begun about six months previously, and had steadily increased. The intense dyspnœa, unfitting the patient for work, was of some three or four weeks' duration. There was hardly any cough. For some two months the voice had begun to be hoarse at moments, and, if persistently used, temporary aphonia ensued, subsiding after repose of the voice. For two days the voice had been permanently and totally veiled, being, in fact, almost indistinct.

On laryngoscopic inspection, the epiglottis was found normal. The arytenoid region and the arytenoid folds were normal, unswollen, and a little vascularized. There was some vascularization of the vestibule of the larynx, which did not appear tumefied. The glottis was completely obstructed, save for a minute passage posteriorly, by a voluminous rounded tumor, as large as the seed of an apricot, intensely red at some points and clearer at others. There was a slight evidence of hemorrhage at the most salient part of its surface. It appeared adherent to the left side of the larynx, in part to the ventricle, in part to the glottis. Being removed in fragments with forceps by Dr. Gouguenheim, it was found on histological examination by Dr. Latteux to be a characteristic myxoma, corneous exteriorly. The laryngoscopic aspect of the tumor and its microscopic characteristics are illustrated in the paper.

DR. GEORGE STOKER reports (*Journ. of Lar. and Rhin.*, 1891, No. 5) an instance of pedunculated malignant growth removed in fragments by electro-

caustic snare from the vocal cord of a gentleman sixty-seven years of age, with subsequent electro-cauterization of the site of attachment. By one histologist it was pronounced a horny carcinoma, by the other an epithelio-matous growth. Success was complete as to voice and comfort of the patient, and there had been no recurrence nine months after the operation, although the affected vocal band remained deeply congested and somewhat thickened.

An inter-arytenoidal sarcoma, the size of a chestnut, was removed from the larynx of a woman, fifty-eight years of age, by M. GEVAERT six years ago (*Annales des Mal. de l'Oreille, du Larynx*, etc., June, 1891), and there has been no recurrence.

FOREIGN BODIES IN THE LARYNX, ETC.

DR. SCHOYLER, of Berlin, extracted (*Journ. of Lar. and Rhin.*, August, 1890) from the trachea of a girl of nineteen a needle attached to a feather. It had been aspirated, and could not be removed by traction on the feather. Laryngoscopic examination showed that it was fixed with one end in the bifurcation of the trachea and with the other on a tracheal ring. The needle was liberated by the aid of a probe introduced between it and the trachea.

A case of sudden death from escape of milk into the air-passages is reported by DR. EMILE MÜLLER (*Gaz. Méd. de Strasburg*, April 5, 1890). A child, five months of age, had no other indisposition than slightly difficult respiration when lying on its back. One morning, after having been nursed and laid down, it made a grimace as though sick at the stomach, became blue, and died in a few moments. At the autopsy the thymus gland was found larger than is usual, and the larynx, trachea, right bronchus, and all its divisions were found filled with milk. The size of the thymus explained the difficulty of respiration alluded to.

MR. LENNOX BROWNE reports (*The Medical Press*, December 17, 1890) an instance of supposed laryngeal cancer or phthisis in a lady thirty-five years of age, from whose larynx he had removed an impacted plate of artificial teeth which, from the history, had been aspirated into the larynx twenty-three months previously, probably during an epileptic seizure. Six weeks after its removal the patient had regained twenty-three pounds of her lost weight. It is remarkable that laryngoscopic inspections had been made by four gentlemen who had failed to detect the presence of a foreign body.

DR. WILLIAM MACEWEN reports (*Glasgow Med. Journ.*, December, 1889) a case in which a nutshell lodged in the trachea for thirteen days was removed by tracheotomy during impending suffocation. It was found buried in the posterior wall of the trachea just under the cricoid cartilage, lying obliquely, and covered to a great extent with granulative tissue, one thin layer of which was spread over the surface of the nutshell. When removed with forceps its concave surface was found to contain a mass of granulation tissue surrounding a portion of the kernel.

An interesting case from the practice of PROF. SONNENBURG is reported by HERMES (*Deut. med. Ztg.*, June 23, 1890). A girl, aged seventeen years, had swallowed a needle the September previous, and had since suffered with intense gastric pains, compelling her to keep the body bent forward. The parts were cut down upon and a projecting point was found in the posterior

edge of the transverse fascia. The peritoneum was incised at this point and the needle was found in a mass of connective tissue in which it had become engaged after having perforated the stomach.

Wounds of the Larynx.

A gunshot wound of the larynx is reported by Dr. G. Fabiani (*Arch. Ital. di Lar.*, July, 1890). A ball from a revolver penetrated the right wing of the thyroid cartilage. Tracheotomy became necessary the following day. Death by septicæmia ensued a few days later. The ball was found to have passed through the left ventricular and vocal bands and to have fractured the base of the left arytenoid cartilage.

Fracture of the Larynx.

Dr. Ubert Clarac reports (*Gaz. des Hôp.*, September 25, 1890) an instance in a man, due to sudden contact against an iron plate which was projecting from a wagon, and which knocked him over backward. Although the symptoms were marked and cutaneous emphysema extensive, tracheotomy was not performed. Sudden dyspnœa and cyanosis occurred on the fourth day, and although tracheotomy was then performed, the patient expired as the trachea was opened. The cricoid cartilage was found to have suffered a double fracture one centimetre to each side of the middle line, and there was nearly complete rupture of the crico-tracheal membrane. The fracture to the right was complete, the fragment separated and the mucous membrane torn. The fracture to the left was in the form of a Y, the lower portion of which was vertical and inferior, and the fragments were in contact. The vocal bands and the ventricles were ecchymosed. The ary-epiglottic folds were the seat of considerable emphysema. Emphysema was extensive in the connective tissue of the mediastinum, the whole cellular tissue protruding hernia-like, when the thoracic covering was removed. The emphysema had invaded the entire trunk and the upper part of the hips. Both lungs were engorged. A little blood was in the trachea.

[It need hardly be said that the issue in this case exemplifies the importance of immediate tracheotomy in all cases of fracture of the larynx, even if performed only as a prophylactic measure; although it must be admitted that severe injury to the cricoid cartilage is fatal in the great majority of instances despite the most judicious management.—Ed.]

Surgeon E. Jeaumaire reports (*Arch. de Med. et de Pharm. Militaire*, January, 1890) a case of multiple fracture of the larynx and of the hyoid bone in an artileryman. While engaged in helping to move an engine formed of two beams connected by a transverse bar of iron, he slipped and fell backward, the bar of iron striking the anterior portion of his neck violently. He expectorated considerable blood, was unable to swallow, and was aphonic. Palpation increased a violent pain felt in the swollen neck, chiefly over the hyoid bone and the thyroid cartilage. At each inspiration a slight depression was noted over the region of the greater horn of the left wing of the thyroid cartilage. There was no emphysema, and there was no crepitation. Death ensued on the seventh day. The hyoid bone was found to have sus-

tained an incomplete fracture or fissure six millimetres in length directed vertically from the upper border of the bone to a point of union of the right horn with the body of the bone. The large horn of the right wing of the thyroid cartilage was completely fractured some millimetres above its union with the lateral face of the cartilage. A vertical fracture in the middle line separated the cartilage into two portions for its entire length, the edges being turned outward, especially on the left side. There were two symmetrical perpendicular fractures of the cricoid a little within the facets where the cricoid cartilage is articulated with the smaller horn of the thyroid cartilage, that on the right side being a centimetre in length, and that on the left being a little less extensive.

DERMATOLOGY.

UNDER THE CHARGE OF

LOUIS A. DUHRING, M.D.,

PROFESSOR OF DERMATOLOGY IN THE UNIVERSITY OF PENNSYLVANIA;

AND

HENRY W. STELWAGON, M.D.,

CLINICAL LECTURER ON DERMATOLOGY IN THE JEFFERSON AND WOMAN'S MEDICAL COLLEGES.

Psorospermose Folliculaire Végétante (Darier).

A. R. Robinson, of New York (*Canadian Practitioner*, vol. xvi.), gives an admirable exposition of this subject, which is now attracting so much attention. According to Darier there exists in man a group of cutaneous diseases which merit the name of psorospermosis, being due to the presence in the epidermis of parasites of the order sporozaires, of the group psorosperms, or coccidia. In one of these diseases the coccidia of a particular species invade the follicular orifices of a greater portion of the cutaneous surface, where they appear in the form of round bodies, generally encysted and contained in the epithelial cells, or as refracting granules, the accumulation of which forms a plug which projects from the orifice of the follicle. This is the disease described by J. C. White as keratosis follicularis, and by Darier and Thibault under the name psorospermose folliculaire végétante. Darier adds, that "the presence of these bodies enables one to make a diagnosis of the disease, as they are not met with in any analogous clinical affection. The neck of the follicles invaded become secondarily the seat of papillomatous vegetations, which can develop to a great degree and form real tumors. The affection, from an etiological point of view, should be placed with Paget's disease of the nipple, and probably with molluscum contagiosum."

Neisser, of Breslau, regards molluscum contagiosum as caused by psorosperms, but this view is not as yet generally accepted—many pathologists, like Robinson and others, regarding the molluscum bodies as chemically changed epithelial cells and not organisms, although believing the disease to

be a communicable one and parasitic in nature. In epithelioma, especially that clinical form known as Paget's disease of the nipple, which was generally considered to commence as an eczematous process, Wickham has endeavored to show that psorosperms are very abundant, and argues that they are essential factors of the disease and the cause of the anatomical changes which occur.

Robinson quotes the cases of J. C. White and of Darier, and gives the notes of a case observed by himself, Weiss and Lustgarten, of New York. All these cases represent the same affection. Dr. Robinson's microscopical studies upon his case show the disease to be a "para-typical" keratosis. Darier and Bowen (in White's case) came to similar conclusions.

Application of Drying-in Liniments (Linimenta Exsiccantia) in the Treatment of Skin Diseases.

Professor Pick, of Prague (*Prager medicin. Wochenschr.*, Jahrgang xvi.), after referring to the gelatin preparations brought forward by him some years ago, calls attention to a new remedy with which he has been experimenting, namely, bassorin (obtained from tragacanth). This kind of gum differs from gum arabic in being almost insoluble, but swells up with water into a syrupy mass which permits of being smeared over and rubbed into the skin in a remarkably satisfactory manner, and drying-in as a thin and delicate covering or film. The formula given consists of tragacanth 5 parts, glycerin 2 parts, water 100 parts, which makes the best consistence. It may be prepared hot or cold. According to the latter method, the finely powdered tragacanth is rubbed with water, the mass taking on a smooth syrupy or lanolin-like character. The application is, when first used, cooling to inflamed skin. As it dries in, a fine, smooth, dry covering forms, with, in the case of inflamed skin, a feeling of tension, which however is not painful, and in its results is beneficial.

A variety of medicaments, both soluble and insoluble, may be added to the base, as in the case of the gelatin preparations and pastes.

Bassorin Paste: a New Base for Dermatological Preparations.

This paste, proposed by Elliott (*Journal of Cutaneous and Genito-urinary Diseases*, vol. ix.) is composed of bassorin, glycerin, water and dextrin. The author's experience permits the following conclusions: 1. Bassorin paste is a perfectly neutral substance, which of itself produces no irritation whatever, and when used alone simply acts as a protective to the skin. It does not become rancid, or decompose, or undergo changes when kept for a length of time, unless it be exposed in an open vessel. When this is done it becomes dry and hard, but even then rubbing it up with a little water renders it again as serviceable as at first. 2. It is easy and simple in application, requiring only to be spread upon the skin with the finger or a brush. It dries in the space of a few minutes if so applied, adheres closely, does not rub off and soil the linen, but forms a flexible coat, which does not interfere with the movements of the body. When its removal is desired, the preparation can be washed off with a little water or a damp cloth or sponge. It remains *in situ*

without change for a variable length of time, depending upon the condition of the surface on which it has been applied. 3. With the bassorin paste almost any drug can be incorporated: those which exist in the form of powders or in solid form in any amount desired; the tars, ichthyol, and oily substances in smaller percentages, but sufficient for all practical purposes. 4. The action of drugs incorporated with it and their effect upon disease appears to be as good as when such are used in other excipients—or perhaps better in some cases. 5. It is of wide applicability and of value in both acute and chronic forms of disease, its use being limited only by the degree of moisture on the surface being treated, or to which it may be exposed.

The exact proportions of the various constituents of this paste are not given by the writer, it being added that the chief one is bassorin.

Report of a Case of Lupus Vulgaris Treated with Koch's Tuberculin.

Loomis and Fuller report (*Journal of Cutaneous and Genito-urinary Diseases*, 1891) a case of long-standing lupus treated successfully by Koch's method. The disease was complicated by an epitheliomatous growth. The case was under treatment twelve weeks, receiving in all twenty-two injections. Five weeks after the beginning of the treatment the disease appeared to be cured. Marked local changes and constitutional reaction occurred during the first two weeks, since which time fever reactions were noted but twice; local disturbances continued during the first month, becoming less and less perceptible. The epithelioma has shown no reparative changes, although the injections were followed by evidences of local reaction. The highest dose was 0.015 c.c. As to the permanency of the cure time must decide. An interesting feature was the fact that the lymph rendered apparent foci of disease before unrecognized.

Lupus Vulgaris Treated with Tuberculin: Death Results.

A case of long-standing lupus of face treated with tuberculin, in which death followed thirty-six hours after an injection of two milligrammes, is reported (*Wien. klin. Wochenschrift*, iii. p. 972) by Garisch. The patient was otherwise healthy. At the same time several other patients were being treated by the same fluid, but showed nothing more than the usual reactions. Following the injection the patient became somnolent; the next day heart action was so frequent that the pulse could not be counted. Patient failed to respond to stimulation and died of heart failure that evening.

At the autopsy were noted: pneumonic infiltration and œdema of the lungs, œdema of the brain and spinal cord, acute swelling of an already enlarged spleen, and slight parenchymatous swelling of liver and kidneys. The pleura, pericardium and spinal cord were the seats of capillary hemorrhages. The local disturbances in the lupus tissue were typical.

An Extensive Case of Favus.

Morris places on record (*British Journal of Dermatology*, vol. iii.) an extremely unusual and extensive case of favus. The patient, a female, aged

thirty-seven years, when coming under observation was suffering with acute phthisis, of which she soon died. Upon examination the scalp, trunk, arms were found to be the seat of favus crusts; the scalp completely covered, the trunk to a great extent, and the arms to a less degree. The finger-nails were also invaded. The disease, according to the statement of the patient, began on the scalp fourteen years previously, gradually involving the whole of that region; two months before coming under the writer's observation the back became affected, and from that time the disease had rapidly invaded other parts of the trunk and arms. The several points of interest in this case are: the extensive area involved, the late age (twenty-three years) at which disease first began, the involvement of the nails, and its rapid spread during the last stage of phthisis.

A Clinical Study of Pruritus Hiemalis.

Corlett reports (*Journal of Cutaneous and Genito-urinary Diseases*, vol. ix.) several cases of this disease—the so-called frost or winter itch. The author's observations as summarized are in the main the experience of others: "1. That the state of the general health has no (?) appreciable effect upon the pruritus. 2. The local irritation of the clothing, although capable of aggravating the malady, is not of itself able to produce it. 3. Meteorological conditions appear to furnish the main etiological factor. These were most potent with a low temperature, low humidity and the wind blowing from the northwest. The greater the velocity of the wind, *cæteris paribus*, the more severe the itching. 4. Pruritus hiemalis is not infrequently associated with other neuroses of the skin."

The author places little reliance upon internal treatment, inasmuch as, with the possible exception of ichthyol, it proved negative. The most efficient local measures employed, which are in the main necessarily palliative, consisted of resorcin, ichthyol and menthol lotions, the first named being usually of greatest benefit. Change to a warm and humid climate, where also the temperature variations are but slight, is curative.

Observations on Two Cases of Lupus treated by Koch's Tuberculin.

These two cases, reported by Leslie Phillips (*British Journal of Dermatology*, vol. iii.), represent deep-seated and superficial types of the disease. In the former case the patient, a male, aged twenty-six years, exhibited the disease, of eight years' duration, on the cheek and ear. In the other—superficial case—the patient, a female child, aged three and a half years, presented two patches, one on the centre of the cheek, and the other on the dorsum of the hand; this latter was secondary, and was, the writer believed, due to auto-infection, the child having the habit of sleeping with this part of the hand curled under and applied to the cheek. Both cases were perseveringly treated by injections of tuberculin in increasing doses, with characteristic reaction. The result in the deep-seated variety was negative; in the superficial type—the child—the result was satisfactory, the two patches "were smooth, pale-red in color, homogeneous in appearance, and entirely free from nodules, either in the cicatrix or in the margin." Six weeks later, "The scar

on the back of the hand is paler, and no suspicion of lupus present; but the periphery of the patch on the cheek is redder, and at one or two points are seen spots which suggest the return of lupous foci."

OBSTETRICS.

UNDER THE CHARGE OF

EDWARD P. DAVIS, A.M., M.D.,

PROFESSOR OF OBSTETRICS AND DISEASES OF CHILDREN IN THE PHILADELPHIA POLYCLINIC;
CLINICAL LECTURER ON OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE;
VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, ETC.

Perforation of the Uterus following an Intra-uterine Douche; Sublimate Poisoning.

Gebhard (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xxi., Heft 2) reports an interesting case in which intra-uterine douches were given to a multipara in the treatment of gonorrhœa. The patient was not pregnant at the time. While the third douche was being given the patient complained of pain in the abdomen, followed by giddiness, vomiting, and unconsciousness. Rapid pulse, with pallid features and perspiration, followed her recovery from the shock of the injection. Symptoms of mercurial intoxication, with bloody, mucous diarrhœa supervened; the patient dying eight days after the injection. On post-mortem examination two perforations of the uterus were found, admitting a uterine sound readily. The sublimate solution, 1: 5000, had been absorbed by the peritoneum. Microscopic examination of the kidneys showed the epithelium of the tubules infiltrated with an amorphous substance from which calcium crystals were readily produced by treating with sulphuric acid.

Puerperal Psychoses, with Reference to Eclampsia.

Olshausen (*Ibid.*) reviews the literature of the puerperal psychoses with especial reference to the relation between them and eclampsia. He concludes that psychoses are not rare after eclampsia, developing usually from two to four days after the eclamptic outbreak. Hallucinations are constant, the derangement proceeds rapidly, without fever, and usually tends to eventuate in recovery. Mental derangement persisting for several months is rare after eclampsia. It is as yet impossible to say what cases of eclampsia especially predispose to psychoses; mental derangement follows various intoxications, and among these are affections following chronic kidney lesions and uræmia.

Olshausen divides puerperal psychoses into: 1. Those following fever—infection psychoses. 2. Idiopathic, without fever or constitutional cause; under this head are included the greater part of the psychoses of the puer-

peral state, that accompanying lactation and following hemorrhage at labor. 3. Intoxication psychoses, following eclampsia, or exceptionally with uræmia without eclampsia.

Knots in the Cord in Twin Pregnancies.

An instance of this rare complication of pregnancy is reported by Herrmann (*Archiv für Gynäkologie*, Band xl. Heft 2). But sixteen cases could be recorded, and as this complication can only arise when the twins occupy the same fœtal sac, its occurrence is rare.

Herrmann's case was one of twin abortion in a multipara, following a fall. The cords seemed fused together in an ovoid mass, which on careful examination was found to be two intertwined figure-of-eight knots. Such intertwining of cords has been observed to follow violent fœtal movements, and also sudden exertion on the mother's part. In the great majority of cases fœtal death and premature labor follow.

Pregnancy Complicated by Fibro-cyst of the Ovarian Ligament; Ectopic Pregnancy, Treated by Laparotomy.

Doléris (*Nouvelles Archives d'Obstétrique et de Gynécologie*, No. 7, 1891) reports the case of a woman who bore a dead child after a protracted labor complicated by the presence of a fibro-cyst of the ovarian ligament. Recovering from this labor she became again pregnant and bore a living child at term. When lactation ceased, her menstruation became deranged, and she consented to laparotomy for the removal of the tumor. This was readily accomplished, the mass proving to be what had been diagnosticated. Uninterrupted recovery followed.

Doléris also reports the case of a woman, married eight years without conception. After amenorrhœa of two months' duration, she expelled a membranous mass from the uterus, with great pain. On examination the uterus was found slightly enlarged. A small tumor could be felt on the left side, behind the uterus. A diagnosis of salpingitis with hæmato-salpinx was made and the uterus was curetted and disinfected. Three days later laparotomy was performed, when tubal pregnancy was found on the left side, and upon the right a sclerosed ovary. The patient made an uninterrupted recovery after the removal of both.

The Protection of the Perineum during the Passage of the Shoulders.

Couder (*Archives de Tocologie et de Gynécologie*, No. 7, 1891) has found it of advantage to unfold an arm when the shoulders present with folded arms after the expulsion of the head. When a hand presents before the shoulders, it should be drawn down and the arm entirely delivered. When this is not possible, the hips of the mother should be raised, and when the head has rotated externally, the head must be pulled down and the anterior arm freed to the elbow. The elbow is then to be flexed toward the back of the fœtus and the anterior arm entirely extracted. The head is then to be raised and the trunk allowed to emerge slowly.

The Development of the Placenta.

A possible explanation of some clinical facts is afforded by YOUNG, in a summary, the results of investigations upon the development of the placenta. It seems probable that the fœtal epiblast extends over the greater part of the placental area, replacing the maternal decidua and resembling in its growth the formation of epithelial tumors. This mass of epithelium is tunnelled by blood spaces communicating with maternal bloodvessels into which fœtal capillaries, free from epithelial investment, project.

These facts explain the ready passage of micrococci from mother to fœtus. Fœtal nutrition results from ready diffusion through the walls of the capillaries. After abortion, retained placental epithelium and continued development of fœtal epithelium may result in carcinoma.—*The Medical Chronicle*, No. 4, 1891.

Maternal Impression followed by the Production of a Monster.

An interesting example of the direct association of maternal impression and the production of monsters is given by GROUND (*Northwestern Lancet*, No. 15, 1891). A primipara, illegitimately pregnant, gave birth to a seven-months' fœtus in which the arch of the skull was absent, and other malformations existed, giving the fœtus an especially horrible appearance. Shortly after, a pregnant patient saw the monster in a jar in a physician's office, and was deeply impressed by its appearance. Six weeks after seeing the monster, she aborted at four months with a monster closely resembling the first.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,

OF NEW YORK.

The Action of the Galvanic Current upon Uterine Fibroids.

BÄCKER (*Centralblatt für Gynäkologie*, No. 28, 1891) reports a case in which intra-uterine galvanization was employed for five months at intervals of two or three days, the strength of the current varying from 50 to 140 milliampères. At the end of this period the tumor had decreased in size one-half, several necrosed fragments having been discharged *per vaginam*. From a careful analysis of similar recorded cases it appears that whenever a fibroid tumor is positively reduced in size by the action of galvanism, this is due to softening of the deeper parts of the neoplasm, with subsequent contraction of the surrounding tissue. There is probably an actual formation of thrombi in the vessels of the tumor. The process of electrolysis does not consist so much in a decomposition of the albumins; the current follows principally the

course of the vessels and secondarily decomposes the interstitial fluid. The necrotic process which follows is aseptic and is unaccompanied with fever or other evidences of inflammation, as in cases reported by Gusserow. This is a strong argument in favor of the powerful antiseptic action of the positive pole, as claimed by Apostoli.

Fibroma of the Ovary.

At a recent meeting of the Vienna Obstetrical Society, Lihotzsky presented a fibrous tumor of the ovary, weighing six pounds, which had been complicated with ascites. It was removed successfully from a patient twenty-three years of age. Chrobak stated that he had removed a similar neoplasm of smaller size, which was also attended with ascites. The latter complication, which was usually present only with malignant growths, he believed was due to excessive dilatation of the vessels, although Olshausen ascribed it to irritation of the parietal peritoneum. Hofmokl held that in the ascites accompanying ovarian fibromata the fluid was clear, whereas in cases of malignant disease it possessed a characteristic turbidity. [No satisfactory explanation has yet been offered for the presence of ascites in connection with ovarian fibromata. The accumulation of fluid is entirely out of proportion to the size of the tumor, which would seem to disprove the theory of peritoneal irritation. Moreover, the smaller fibromata are often hard and non-vascular; the vessels in the pedicle are of average size, and there is no evidence of venous obstruction and dilatation. It is well known that these tumors have usually long pedicles and are seldom adherent, so that they are freely movable. This fact would seem to suggest the possibility of the ascites being due to direct pressure upon large veins, were it not for the absence of œdema of the lower extremities. Torsion of the pedicle may exist without ascites. We have discussed this interesting class of neoplasms at length in the *American Journal of Obstetrics*, vol. xv. p. 561.—H. C. C.]

Abdominal Extirpation of the Fibroid Uterus.

Lihotzsky (*Wiener klin. Wochenschrift*, No. 27, 1891) reports ten cases of abdominal hysterectomy in Chrobak's clinic with only one death, from causes independent of the operation.

Chrobak's technique is briefly as follows: After ligating the broad ligaments, the operator dissects off the peritoneum anteriorly and posteriorly, and separates the bladder as low as the vaginal fornix. The cervix is then constricted with a rubber cord, the tumor is removed, and the cavity of the stump is packed with iodoform gauze (after being thoroughly cauterized), which is closed in with temporary sutures. The vaginal fornix is then opened, a sound being introduced from below as a guide; the uterine arteries are tied, and the stump is removed. After tamponing the wound from above, the edges of the peritoneum are united in such a way as to cover in the stumps of the broad ligaments, and the abdominal wound is closed, drainage being maintained *per vaginam*. The advantages of this method over supra-vaginal amputation are not only the avoidance of the danger of sloughing of the stump, but the shortening of the period of convalescence, and the doing away with repeated dressing of the wound. The operation is practically reduced to the

level of a simple ovariotomy, and there is no unsightly and painful cicatrix, or risk of hernia. The patients are free from the discomfort incident to traction of the stump.

[This would appear to be the ideal operation for fibroids, although the technique is not new, as the writer admits the closure of the peritoneum to be the essential improvement. When the patient is placed in Trendelenburg's posture, as recommended by Dr. Krug, of New York, we have found that total extirpation of the uterus can, in an ordinary case, be performed with the expenditure of but little more time or labor than supra-vaginal amputation. Whether the removal of the stump seriously weakens the pelvic floor, and leads to subsequent prolapse of the vagina and bladder, is a point to be settled only after a number of patients have been kept under prolonged observation.—H. C. C.]

The Ultimate Results of Vaginal Hysterectomy for Cancer.

Leisse (*Archiv für Gynäkologie*, Band xl., Heft 2) replies to the criticisms of the statistics of the Dresden clinic by presenting a tabulated statement of the histories of all the patients, so far as they could be obtained. These are compiled with great care. Of eighty patients who were heard from upwards of two years after the operation, 56.25 per cent. were still living. Since eight of the deaths were not due to a recurrence of the disease, this leaves the actual mortality only 17.8 per cent. Thirty-seven of the forty-five surviving patients were examined at the clinic, so that there was no question as to their local condition, and in the other cases reports were received from competent physicians. The following are the facts: Of eighty patients examined over two years after operation, forty-five were free from recurrence; 58.6 per cent. (out of fifty-eight patients examined) were well after three years; 59.5 per cent. (out of forty-two) after four years; 60 per cent. (out of thirty) after five years; 66.6 per cent. (out of nine) after six years; and the two patients who had survived the operation seven years were both perfectly well. [The writer properly makes no comment on these statistics. They need none. So conscientiously have they been compiled that no room is left for scepticism. The opponents of vaginal hysterectomy will find in them food for reflexion.—H. C. C.]

The Results of High Amputation of the Cervix Uteri for Cancer.

Winter (*Ibid.*) commends the operation in cases of commencing epithelioma of the portio vaginalis. Subsequent observation of patients on whom high amputation has been performed has shown that not only is conception possible, but that parturition may occur normally. Obstructive dysmenorrhœa is rare after the operation, and is easily overcome; neither has the writer observed the development of marked endometritis, as claimed by Schauta. The principal argument in favor of high amputation, in incipient cases, as compared with total extirpation, is the less danger attending the former operation. At the Berlin clinic 35.7 per cent. of the patients were free from recurrence upward of two years after operation.

[The relative claims of the two operations could be more accurately deter-

mined if operators would only state clearly the exact anatomical condition in every case of total extirpation. It goes without saying that when the disease is limited to the portio, the chances of recurrence after either operation are vastly less than when it has extended along the cervical canal as high as the os internum. We may safely assume that, in the hands of an expert operator, recurrence within six months after total extirpation means that the case was not a proper one for the radical operation. Every honest surgeon ought to be willing to frankly acknowledge this. Americans will never succeed in settling this vital question until they lay aside personal, and what might be termed national, prejudices and discuss it in a broad scientific spirit.—H. C. C.]

The After-treatment of Laparotomy.

Kehrer (*Ibid.*) read a paper on this subject at the recent meeting of the German Gynecological Society, in which he referred to the fact that the diminution in the mortality was due to the simplification of the technique. In a considerable proportion of the fatal cases death was due to heart-failure, pneumonia, and chloroform. The greatest danger from the operation, he believed, was due to the escape into the cavity of septic fluids, especially pus, fecal matter and portions of malignant growths. The usual practice was to remove these by sponging and irrigation, but the reader believed that it was better to prevent them from escaping by surrounding the pedicle of the tumor with a rubber cloth in the form of a sleeve and packing its cavity with gauze, so that any fluid which escaped would at once be absorbed. The pedicle could then be tied and the entire mass be removed without exposing the tumor.

In order to prevent the formation of adhesions no antiseptic fluids should be brought in contact with the peritoneum, nor should any strong antiseptic be applied to the stump. Early evacuation of the bowels was correct both in theory and practice, since after every abdominal section the intestines were in a state of atony. Finally, it was highly important that there should be a firm cicatrix in the line of the incision in order to prevent the subsequent development of hernia. If the linea alba was much relaxed it was better, he thought, to excise sufficient tissue to obtain firm union.

The Condition of the Ovaries in Cases of Fibro-myoma.

Hofmeier (*Ibid.*) calls attention to Hegar's theory that after castration not only is the influence of the ovarian nisus eliminated, but a diminished amount of blood is supplied to the tumor. He believes that in the majority of the cases the latter fact alone explains the cure. In two instances he found the ovaries atrophied, with few or no traces of ovisacs, yet hemorrhage ceased after their removal. He asks if the same result might not be obtained by simply ligating the ovarian arteries.

Bulius (*Ibid.*) has examined the ovaries in fifty cases of uterine fibro-myoma, and finds that anatomical changes are the rule. He makes the following deductions: 1. In cases of fibro-myoma the ovaries undergo changes. 2. The stroma is the seat of both hyperplasia and hypertrophy. 3. The

vessels are the seat of marked changes. 4. Cystic degeneration of the Graafian follicles is common. 5. The primordial follicles are destroyed.

[Every pathologist will be inclined to agree with the latter writer. Hofmeier's deductions are clearly founded on insufficient anatomical evidence.—H. C. C.]

The Influence of the Climacteric upon Fibro-myomata.

Müller (*Ibid.*) has made a careful study of this subject, based upon 109 cases. He found that while in many cases the tumor evidently diminished in size after the menopause, in nine instances it was clearly proved that the neoplasm continued to grow; such an increase in size was noted in women aged fifty-six and seventy-nine respectively. He infers that it is not safe to trust too much to the curative influence of the menopause.

In opening the discussion Werth took occasion to differ from Hofmeier regarding the effect of castration. The removal of the ovaries had, he believed, a direct atrophic influence upon the tumor. When menstruation ceases its vascular supply is diminished, but if the hemorrhages continue atrophy does not take place. Tait's statements on this question were valueless.

Benckiser stated that in examining a fibroid uterus removed three months after castration had been performed, he found the same atheromatous changes in the vessel walls which were so often observed after the climacteric. This was a form of obliterating endarteritis which Thoma had described as a result of extensive arrest of the capillary circulation of an organ.

Veit said that he had seen large myomata increase in size in elderly women. He did not expect retrograde changes to take place in the tumor before the age of fifty or fifty-four. Progressive increase of the neoplasm after the climacteric must be due to some unusual source of blood-supply.

Fritsch had found that the occurrence of both the artificial and the natural climacteric arrested the growth of the tumor. If it continued to grow, it was usually due to cystic degeneration of the neoplasm.

Note to Contributors.—All contributions intended for insertion in the Original Department of this Journal are only received *with the distinct understanding that they are contributed exclusively to this Journal.*

Contributions from the Continent of Europe and written in the French, German or Italian language, if on examination they are found desirable for this Journal, will be translated at its expense.

Liberal compensation is made for articles used. A limited number of extra copies in pamphlet form, if desired, will be furnished to authors in lieu of compensation, *provided the request for them be written on the manuscript.*

All communications should be addressed to

Dr. EDWARD P. DAVIS,
250 South 21st Street, Philadelphia.